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AUGUST 1994 • ISSUE NO. 71
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See Page 25

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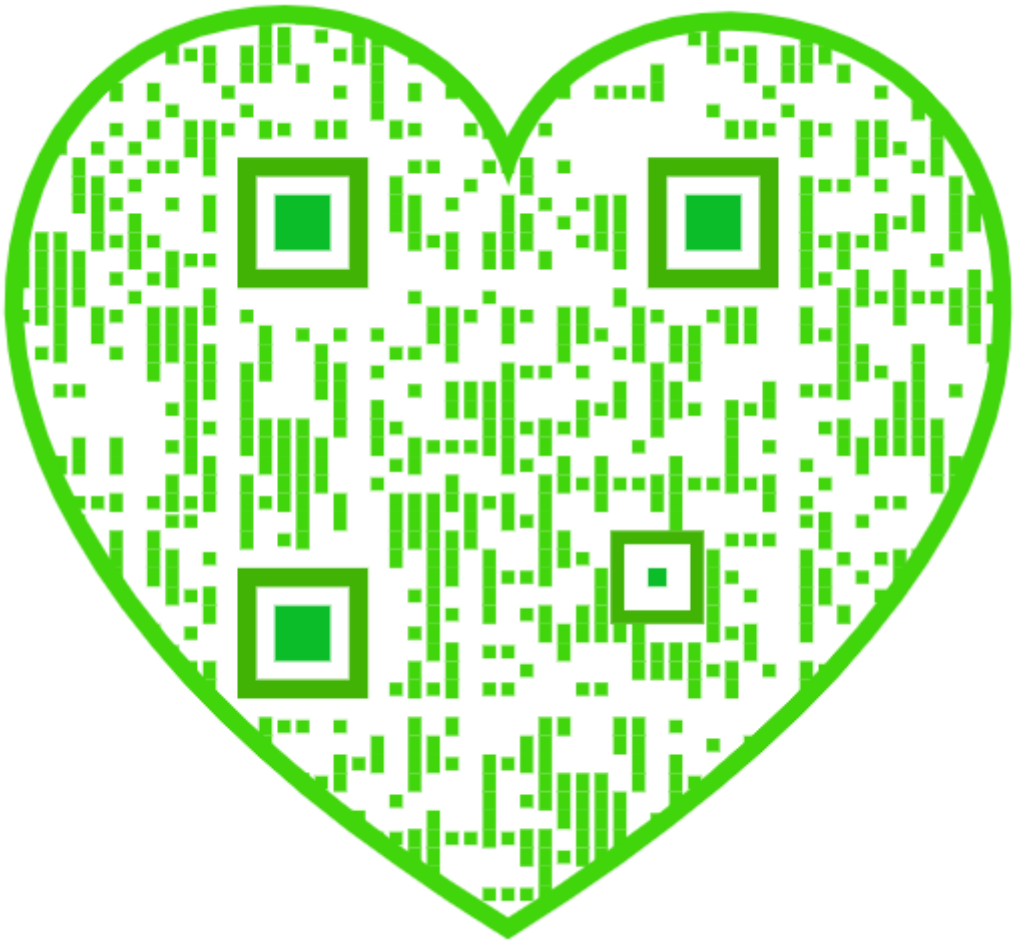

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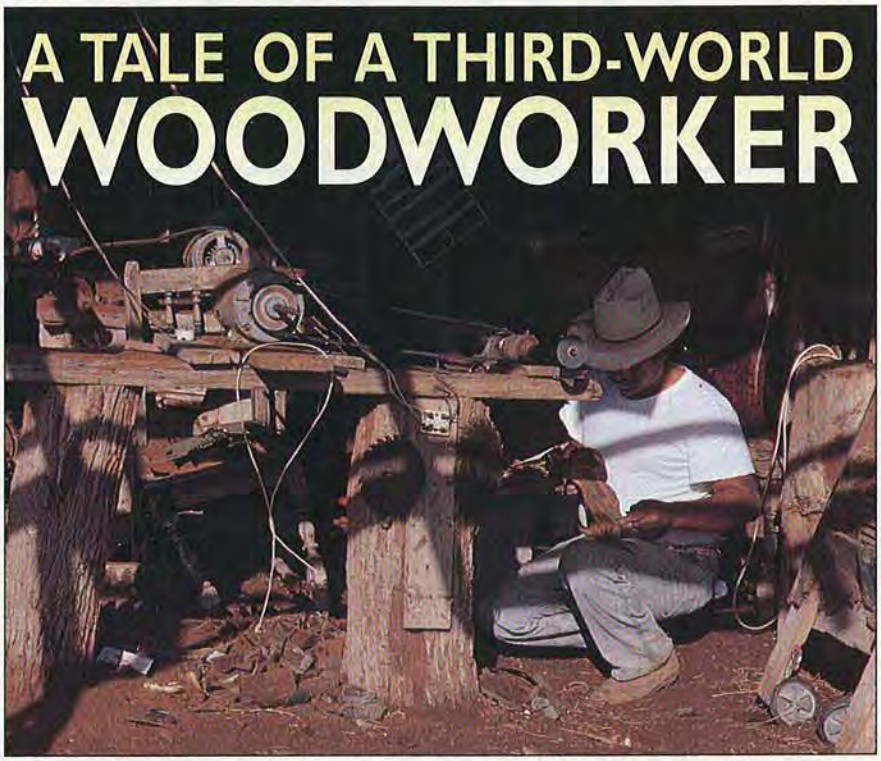
THE EDITOR'S ANGLE

A TALE OF A THIRD-WORLD WOODWORKER



Ironwood figure carver Refugio Garcia at work on a sailfish in his shop. With just a few well-worn tools, he creates works of art that rival any I've ever seen.

I'm not a great woodworker by any means—just average. But I have been fortunate indeed to have met a fair number of the "great ones" during my 10-year association with *WOOD®* magazine.

Turners Dale Nish and Rude Osolnik, furnituremaker Ian Kirby, carver Fred Cogelow, cabinetmaker George Reid, intarsia-artist Judy Gale Roberts—each of these craftsmen and craftswomen and a few dozen others have been blessed with a level of talent that only a few people possess. And their work shows it.

A few months ago I happened onto yet another woodworking "giant" when I was in Mexico researching the "Masterpieces From Mexico" article that appears in this issue. His name is Refugio Garcia; he carves ironwood figures for a living in Kino Bay, Mexico. You'll never see him demonstrating at a woodworking show or giving a lecture somewhere, but he ranks right up there with the best of the best.

As you can see, his workshop is primitive. But that doesn't stop this Mexican artisan from crafting some of the very finest carvings I've ever seen—and doing it in a most unusual way. Take a look at *page 32*, and I think you'll be as amazed as I was at what emerges from Refugio's humble shop.

Larry Clayton

Photograph: Bob Hawks

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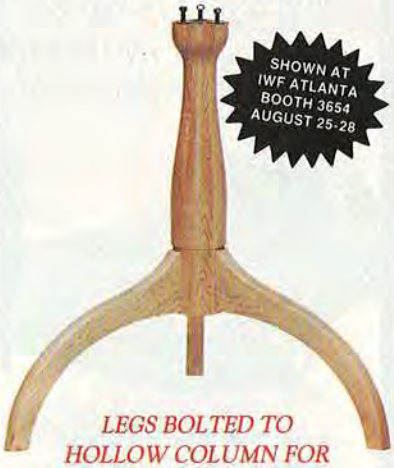

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AUGUST 1994 ISSUE NO. 71

WOOD PROFILE

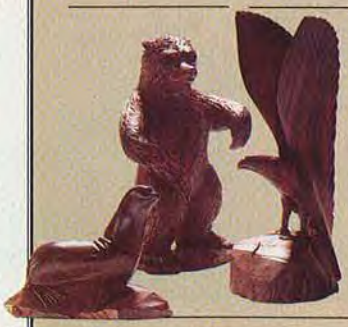
Hackberry: The wood you could call "poor-man's ash" 23
Though neglected by early colonists, this species later received the attention of barrelmakers, cabinetmakers, and furnituremakers.

TOOL BUYMANSHIP

Jazzed up about jigsaws 25
Looking for accuracy and speed when cutting curves? Then, take one of today's new-generation jigsaws for a spin. We did. In fact, we tested 16 of the latest models (by 11 different manufacturers), and, boy, were we impressed!

TURNING

Just spoolin' around 30
Make this hollow, lidded spool for holding needles and pins, then sew up a friendship by giving it to your favorite seamstress.



CRAFTSMAN CLOSEUP

Masterpieces from Mexico .. 32
Travel south of the border with *WOOD* magazine Editor Larry Clayton as he spends a day with one of Mexico's most talented ironwood carvers, Refugio Garcia.

SHOP-TESTED TECHNIQUES

Stacked-ring vessels 38
You don't need a lathe to shape the stunning vessel and bowl shown in the photo *left.* But you do need a jigsaw. Surprised? You'll be equally delighted when you find out how easy they are to make.

NOW YOU CAN BUILD IT

Lovely laminated lamp base 44
Put our stacked-ring construction technique to work by building this eye-catching tabletop project.

This issue's cover wood grain: beech

CARVING

North woods nester.....48
Capture in wood one of nature's most beautiful birds, the loon, using our detailed instructions. Order the blanks to speed the work.

Sunny-day sandbox.....52
Build a backyard play structure for your kids with this outdoor project plan. At the day's end, store toys in the flip-top box.

Spotlight on router safety.....56
Learn the do's and don'ts for successful, injury-free routing.

Picnic-perfect table and benches.....58
Enjoy summer to the max with this outstanding outdoor furniture set. Dimensional lumber makes construction inexpensive and easy.

WHAT WOODWORKERS NEED TO KNOW

How to paint outdoor projects.....62
Protect your deck, patio, and lawn projects from nature's wrath with the painting pointers found here.

CRAFT SHOP

A fish out of water.....64
Scrollsaw a long-legged aquatic wonder.

It's a cinch.....66
Buckle up with this unique herringbone project.

Lesser-known species.....68
Discover a new, attractive selection of exotic woods and our sources for purchasing them.

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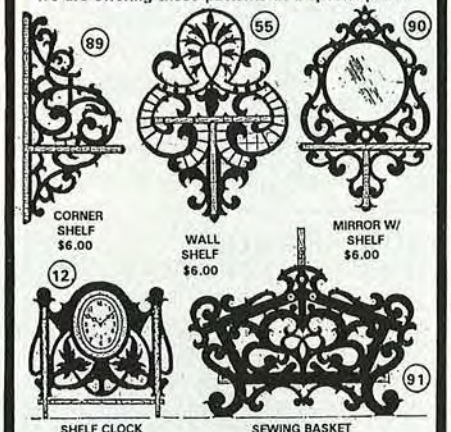

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*Overstrike test conducted by striking hammer handle against metal object. © 1994 The Stanley Works

TALKING BACK

Print this article

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, Better Homes and Gardens® *WOOD*® Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.

Sure cure for muffled chimes

I made the oak cabinet for the "Wall Clock" design in the June 1993 issue. I used the clock kit that you recommended, but upgraded the mechanism to a chime movement. However, the chimes are very muffled inside this case. What can I do to make them louder?

—William Doutel Jr., Langhorne, Pa.

The type of mechanism you purchased, Bill, will determine what you need to do to amplify the chime sounds. A clock mechanism with detachable sounding-rod chimes needs only to have the sounding-rod unit fastened to the case side. The wood then functions similar to the sounding board of a piano, increasing the volume of the chimes.

A clock mechanism with electronic chimes will require a sound hole in the clock case to improve the chimes' tone. Drill a 1½–2" diameter hole in the case side behind the clock movement. If your mechanism has a detachable speaker, fasten this speaker directly behind the sound hole. Cover the hole with a decorative grille of your choice. You can scrollsaw a wooden one of your own design, or use a commercially available item. Here are two sources for sound-hole covers:

1) 2⅜"-diameter wooden sound-hole rosettes, available in several patterns, $7.95 each from Musicmaker's Kits, P.O. Box 2117, Stillwater, MN 55082-3117. Call 800/432-5487.

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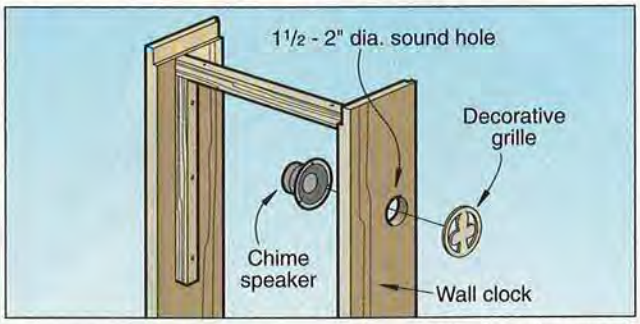

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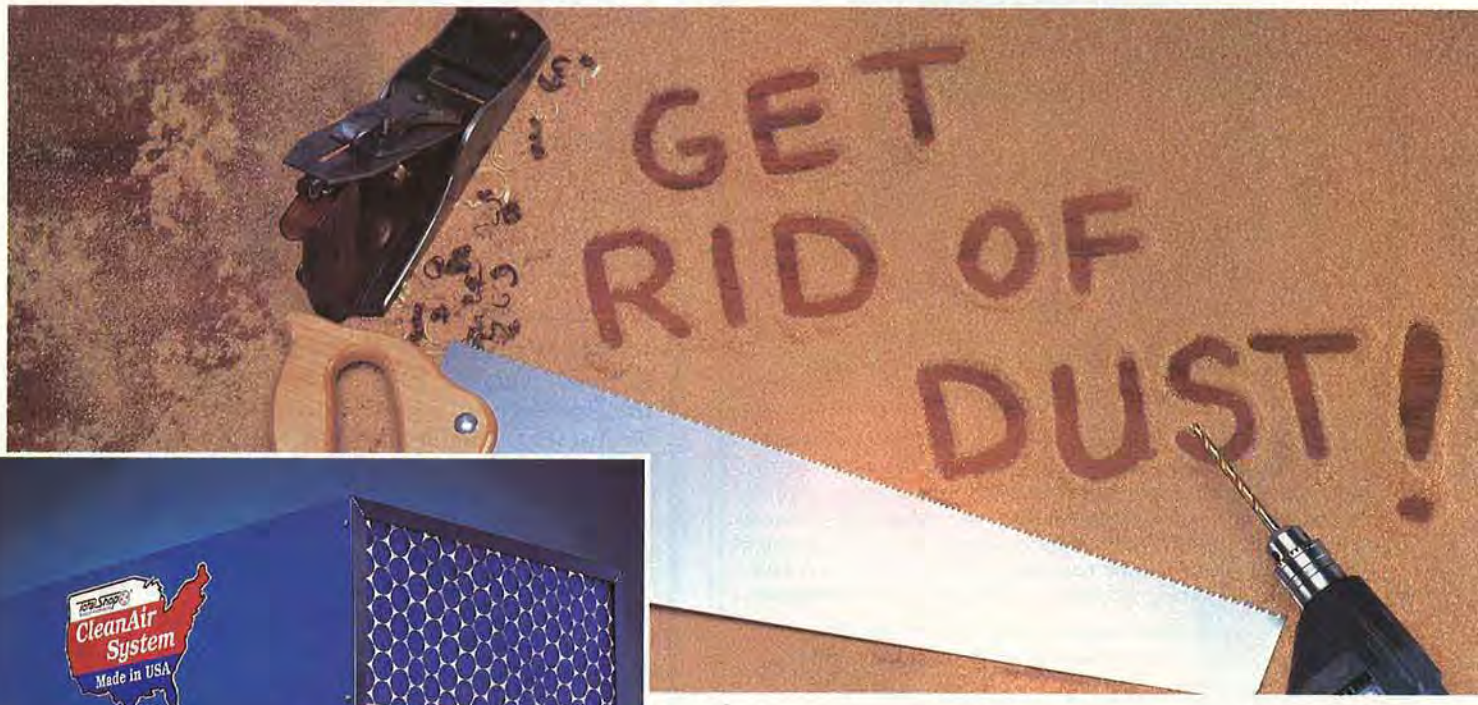

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TALKING BACK

Continued from page 6

In praise of Wood-Mizer

Your article on the Wood-Mizer bandsaw mill hit home. Several years ago, Michael Park of Suttons Bay, Mich., used one of these machines to saw some oak and birch for me. He produced an impressive number of board feet of lumber. One cannot exaggerate the precise evenness of cut, edge to edge, the full length of the board. I reduced the very smooth cut to a planed surface on each board with a loss of only 3/16" of thickness.

—Marvin C. Howe, Traverse City, Mich.

In hot water over Cool Blocks®

In the November 1993 issue, you state that the Jet bandsaw comes with Cool Blocks as standard equipment. That is not correct. Cool Blocks is a registered trademark of Garrett Wade Co., Inc., and can be used with our permission to refer only to the use of our special patented dry-lubricant impregnated bandsaw-blade guide blocks.

Traditionally, mild steel has been used for these guide blocks. Some manufacturers have attempted to imitate Cool Blocks by using other non-traditional materials. None of these imitations use the Cool Blocks material, and none of them will perform like Cool Blocks.

Cool Blocks are currently available from tool suppliers, Sears stores, and Delta dealers, as well as Garrett Wade. They also may become original equipment on some bandsaws in 1994, but if so, the manufacturers will advertise this fact by using the registered trademark.

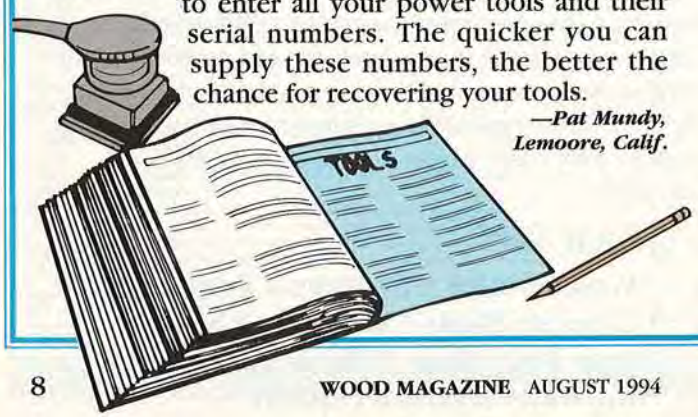
—Garry Chinn, Garret Wade Co., New York

Tool protection by the numbers

As a police officer, I have taken numerous reports from people whose workshop has been broken into and their power tools taken. Most of these owners don't know the model number or the serial number of their missing tools. It is essential for the investigating officer to have these numbers in order to enter the items into the National Criminal Identification System. To delay this listing is to lose precious time in the investigation.

I have a suggestion for a safe and easy-to-find location for these numbers. Write them in your family's telephone directory. There's plenty of room in there to enter all your power tools and their serial numbers. The quicker you can supply these numbers, the better the chance for recovering your tools.

—Pat Mundy, Lemoore, Calif.



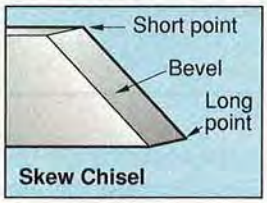
Which way is down?

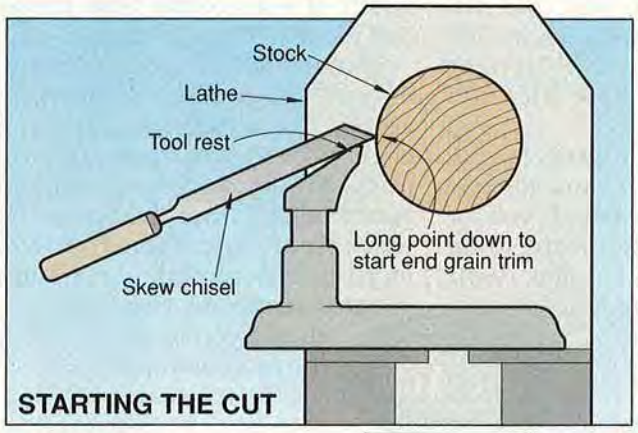
I just finished reading "Turning Between Centers" in the October 1993 issue. In the section on cutting square shoulders, you mention you use the skew chisel "with its pointed end down". The final sentence in that section says to "gradually raise the tool's handle so it's almost level by the end of the cut". These sentences seem contradictory to me. Can you please enlighten me?

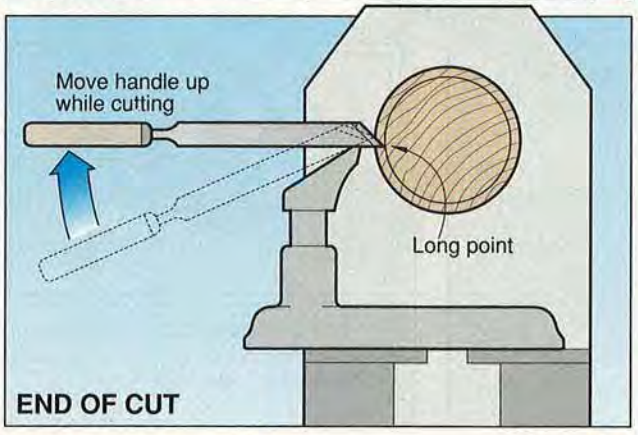
—Dale Messmore, East Peoria, Ill.

Sorry about the confusion, Dale. We'll try to clear things up.

A skew chisel has a long point and a short point on it's beveled end as shown below. *To use this tool as described in the article, position the skew chisel with the edge of the chisel leading to the long point resting on the tool rest. Then lower the handle of the chisel, raising the long point of the bevel. Start the cut on the edge of the shoulder, using the very tip of the chisel (the long point), and slowly raise the handle of the tool as the cut is being made. This will feed the long point of the tool into the wood in a smooth motion, giving a clean, non-tearing trim to the shoulder.*







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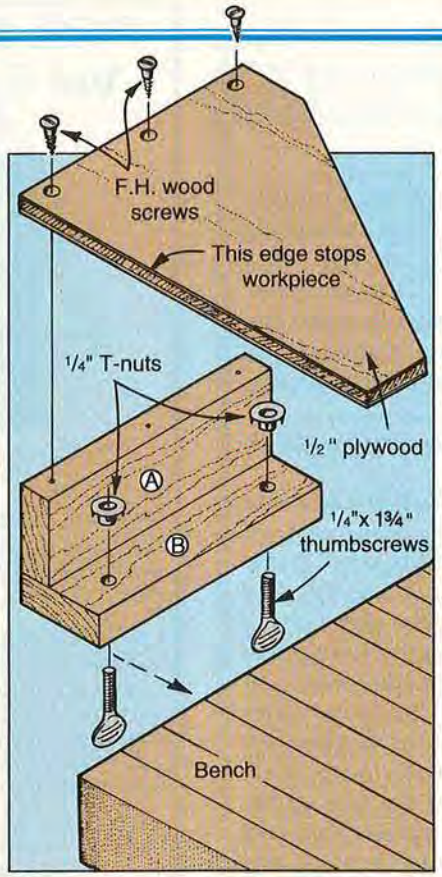
Bench stop works great without any holes

If you don't use bench dogs often, you may not want to drill holes in your benchtop. Still, you'd like to have a way to keep a workpiece from sliding around.

TIP: Build a stop that clamps onto the edge of your bench. Cut parts A and B from ¾"-thick stock 6" long. Make the width of A equal to your benchtop's thickness plus about 1/16"; part B about 2" wide. The plywood stop measures ½×6×10". Drill part B where shown for two ¼" T-nuts, and assemble the parts as shown with screws and glue. Thread in a pair of ¼" thumbscrews. When locked in place parallel to your vise jaws, the straight plywood edge holds stock securely in position.

—Alfred Boice, Louisville, Ky.



EARN CASH, PRIZES FOR YOUR TOP SHOP TIP

Do you have a great shop tip (or two) you'd like to share with other *WOOD*® magazine readers? For each published submission, you will get at least $40 from *WOOD* magazine (as much as $200 if we devote a page or more of space elsewhere in the magazine to your idea). You also may earn a woodworking tool if we select your idea as the Top Shop Tip for the issue.

We try not to use shop tips that have appeared in other magazines, so please send yours to only one. *We do not return shop tips.* Mail your tip(s), address, and daytime phone number to:

Top Shop Tip
***WOOD* Magazine**
1912 Grand Ave.
Des Moines, IA 50309-3379

Pull out all the stops when you rout multiple mortises

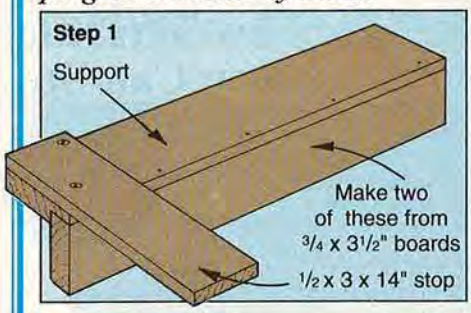
You need a lot of mortises, but you don't own a mortising attachment for your drill press. And you don't want to spend hours chopping the mortises by hand.

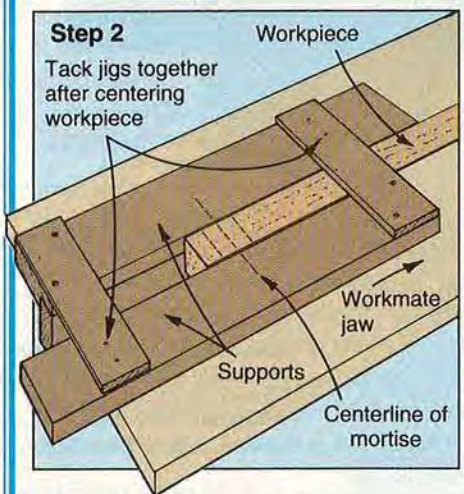
TIP: Use a plunge router and these jigs to cut mortises as fast as you can rout them. Glue and nail together two jigs as shown in *Step 1.* Make them about 4" longer than your router base plus the length of the mortise.

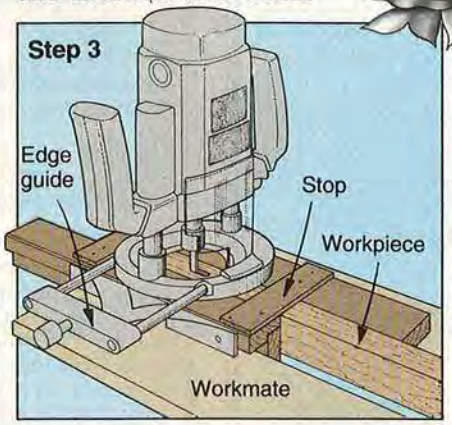
Turn the jigs so the stops face in opposite directions, and loosely position them in a bench vise or Workmate. Slide the board to be mortised between the jigs, with the centerline of the mortise as shown in *Step 2.* Align the two stops so that the distance from the mortise centerline to each stop measures half the length of the mortise plus half the width of your router base minus half the diameter of your bit.

Tighten the vise or Workmate, extend the mortise centerline across the supports, and tack each stop to the opposite support. Attach an edge guide to your router, center the bit on the workpiece, and then rout the mortise. The centerline markings you made on the supports enable you to quickly align the next workpiece.

—Ronan Cambridge, Ottawa, Ont.







For his prize-winning tip, Ronan will receive a six-piece, ½"-shank router bit set from CMT Tools.

Continued on page 12

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TIPS FROM YOUR SHOP (AND OURS)

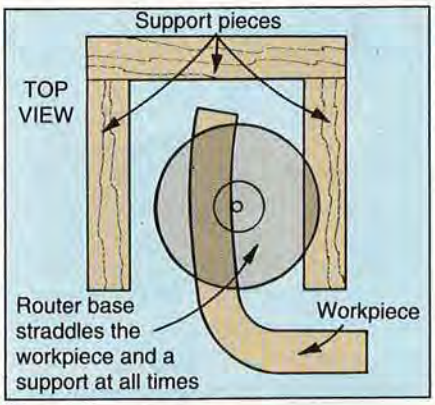
Continued from page 10

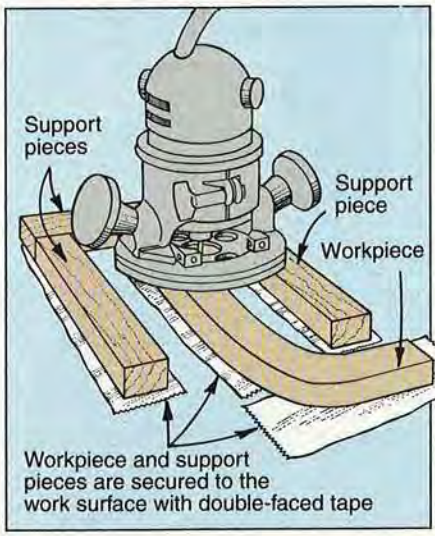
Scrapwood shapes give router needed support

Edge-routing narrow, curved workpieces becomes a challenge without a router table. The router keeps tipping, digging the bit into your work and spoiling it.

TIP: From scrapwood the same thickness as your workpiece, cut straight or curved supporting pieces about 1" wide. Arrange them around your workpiece as in the example shown, and then rout away. With the router riding on both the workpiece and the supports, you'll avoid nicked edges and chewed-up corners. Be sure to make the supports the same height as the workpiece. If you use double-faced tape to hold the workpiece in position, for instance, use it to hold your supports, too.

—Alex Polakowski, Skokie, Ill.




Support pieces
Support piece
Workpiece
Workpiece and support pieces are secured to the work surface with double-faced tape

A neater way to mix and apply putty is in the bag

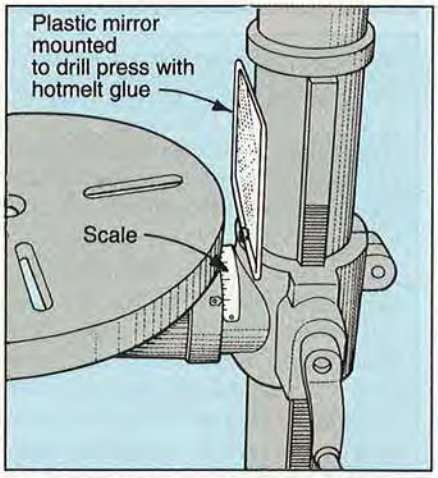
Mixing water putty and similar products poses a couple of problems: What do you mix it in, and how do you stir it thoroughly without spilling it all over?

TIP: Grab a resealable sandwich bag the next time you mix putty. Measure out the powder, pour it into the bag, and add the water. Then, seal the bag and knead it to mix without making a mess. To apply, snip off a corner of the bag and squeeze out the putty.

—Paul J. Feller, Dubuque, Iowa

Mirror reveals hidden scale on drill press

They might just as well have left the tilt-angle scale off your drill-press table. You certainly can't see the thing very easily.



TIP: Peek at the scale with a small purse mirror. Position the mirror on the table support where shown, and then tilt it to reflect the scale. Secure the mirror with hotmelt glue.

—Sidney O. Jackson, Carlyle, Sask.

Continued on page 14

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Poplar	4/4	Select	1.45	$ 52.00
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White Oak	4/4	Select	2.20	$ 67.00
Cedar (Aromatic Red)	4/4	1C+Btr.	1.55	$ 54.00
Cypress	4/4	Select	1.85	$ 60.00
White Pine	4/4	F.G.	1.10	$ 43.00
Yellow Pine	4/4	Clear	1.50	$ 53.00

Above prices are for 100' quantities of kilndried rough lumber sold by the Bd. Ft. FOB Mayodan, NC. Call for quantity discounts. Other sizes and grades available.

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TIPS FROM YOUR SHOP (AND OURS)

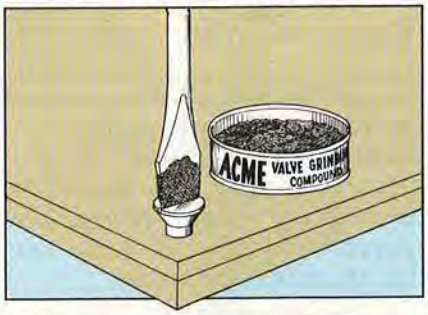
Continued from page 13

Grinding compound keeps screwdriver in the slot

While trying to remove a screw that just won't budge, you twist the screwdriver even harder. The sides of the blade ride right up the sides of the slot and pop out—a phenomenon technical types call "camming out," and which you call a major irritation.

TIP: Buy a can of valve-grinding compound, an abrasive powder suspended in oil. (Auto-parts stores sell it.) Dip the end of the screwdriver into the compound. The abrasive particles between the screwdriver blade and the screw slot prevent cam-out, so you can put more oomph on the screwdriver to break that stubborn fastener loose.

—Gordon Reiter, Ridgway, Pa.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Gluing up stacked materials often proves tricky. For a simple solution, take a look at the threaded-rod clamping set-up we developed for the Stacked-ring Vessels article, *page 41*.
- If you're stuck with a sticker that won't peel off neatly, try gently warming the sticker with a heat gun on a low setting. The heat softens the glue so the sticker peels off cleanly.
- Cutting sandpaper ruins knives and scissors. Use an old hacksaw blade instead. Hold it flat on the sandpaper and pull the paper up against the teeth of the blade.

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Since 1946, Forrest has been a leader in manufacturing high-quality saw blades. The secret to our success is attention to detail. We incorporate handwork into each blade and consistently hold blade runout to between 0.001 and 0.002 in. We also use micro-grain, corrosion resistant C-4 carbide tips and hone them to a razor-sharp, mirror finish with 600-grit diamond wheels. All this guarantees you exceptionally smooth cuts and extends blade life up to 300% longer than other carbide blades. Over 100,000 owners already know that saw blades don't get any better than Forrest.

WOODWORKER II
THE BEST BLADE FOR YOUR TABLE SAW

No general purpose blade produces better results than the Forrest Woodworker II.
Jim Forrest

This all-purpose blade:
- Ends bottom splintering
- Ends scratchy saw cuts
- Ends blade changing—rips & crosscuts

You get a ready-to-glue joint right off the saw!
Specs: 15° ATB, +20° face hook

Dia.	Teeth	Kerf	Bore	List	SALE
12"	40	1/8"	1"	$183	**$129**
12"	30	1/8"	1"	162	**119**
10"	40	3/32"*	5/8"	156	**119**
10"	30	3/32"*	5/8"	135	**99**
9"	40	3/32"	5/8"	146	**109**
9"	30	3/32"	5/8"	125	**99**
8 1/4"	40	3/32"	5/8"	136	**99**
8"	40	3/32"	5/8"	136	**99**
8"	30	3/32"	5/8"	115	**89**
7 1/4"	30	3/32"	5/8"	112	**69**
6"	40	3/32"	5/8"	139	**89**

*1/8" Kerf available

WOODWORKER I
THE BEST BLADE FOR YOUR RADIAL ARM SAW

Woodworker I gives you:
- Mirror-smooth cuts
- No bottom and top splinter in push/pull mode on radial arm saw

Specs: 30° ATB, +5° face hook

Dia.	Teeth	Kerf	Bore	List	SALE
12"	60	1/8"	5/8"	$198	**$139**
10"	60	3/32"	5/8"	162	**129**
9"	60	3/32"	5/8"	156	**119**
8 1/4"	60	3/32"	5/8"	150	**109**
8"	60	3/32"	5/8"	150	**109**

DURALINE HI-AT
THE BEST BLADE FOR PLYWOOD & LAMINATES

- The ultimate for splinter-free cuts

Specs: 40° ATB, +5° face hook

Dia.	Teeth	Kerf	Bore	List	SALE
12"	100	1/8"	1"	$253	**$215**
12"	80	1/8"	1"	212	**181**
10"	80	3/32"*	5/8"	207	**159**
9"	80	3/32"*	5/8"	207	**179**
8"	80	3/32"*	5/8"	202	**169**
7 1/4"	60	3/32"	5/8"	149	**129**

*1/8" Kerf available

Boring up to 1 1/4" available on all Forrest blades: $7.50 extra

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Sears 8 1/4" & Delta	8 1/4"	60	5/8"	170	**99**
Hitachi 8 1/2", DeWalt & Ryobi	8 1/2"	60	5/8"	179	**109**
Delta	9"	80	5/8"	204	**119**
Ryobi, Makita & all others	10"	80	5/8"	207	**129**
Hitachi, B&D, DeWalt	12"	80	1"	229	**139**
Ryobi, Makita	14"	100	1"	266	**179**
Hitachi	15"	100	1"	277	**189**

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10" dia. set, 5/8" or 1" bore	389	**349**

(Boring up to 1 1/4": $25 per set)

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You've probably read the recent articles on the new "quiet" blades. But the fact of the matter is a Forrest 80 tooth Duraline Hi-AT with blade stiffener cuts 50% quieter than those so-called "quiet" blades.

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-Herbert Needlman, Greenlawn, NY

I recently ordered your Woodworker I & II saw blades for my radial and table saws. I find your blades to be the highest quality. They produce a velvet cut with a polished finish. The quality is not just good—it is exceptional!
-David Hares, St. Louis, MO

(Your) Woodworker II blade is by far the finest saw blade that I have ever used. I also have the Forrest dado set which is without a doubt the king of all dado sets. I work exclusively with red oak and oak veneer plywood, and the dado set performs splinter-free cuts as advertised.
-Dennis Schule, Owatonna, MN

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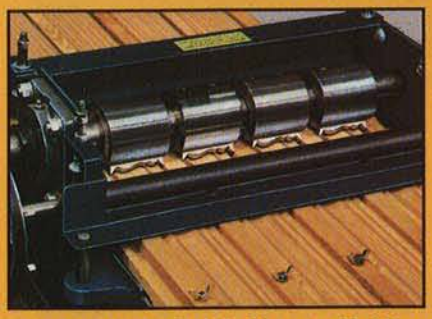

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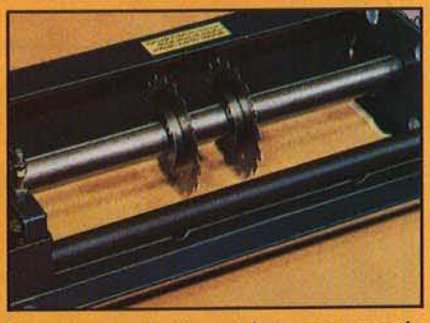

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Editor, Workbench Magazine

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E. D. Holtz, North Carolina

ASK WOOD

Print this article

Whether your woodworker's license reads "Beginner," "Intermediate," or "Advanced," you're bound to have a few questions about your favorite hobby. We can help by consulting our staff and outside experts. Send questions to: Ask *WOOD*®, Better Homes and Gardens® *WOOD* Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379

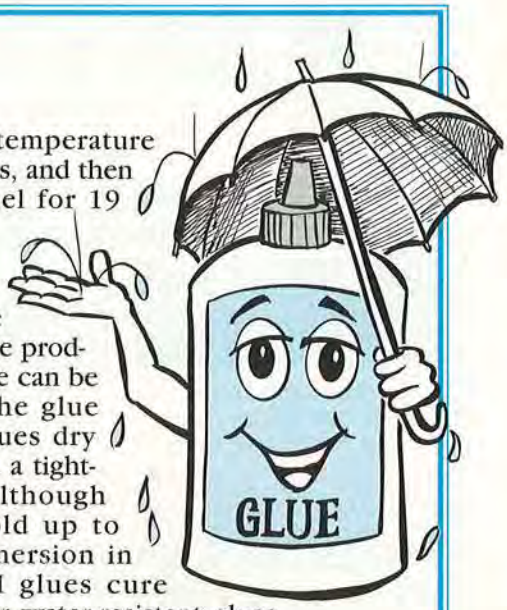
These glues hold up in water

I would like to use a waterproof glue in assembling the blanks for my stacked, turned bowls. What glue would you recommend?

—William R. Bohnsack, Longville, Minn.

There are three types of glue that will work for you, Bill. Resorcinol glue will hold the wood together, but this glue does have the drawback of drying with a dark glue line. Use resorcinol glue where you join dark and light colored woods, as the color contrast between the woods will hide the glue line.

Franklin Titebond II and Elmer's Weather-Tite Wood Glue both pass "Type II" testing for water *resistance.* This test involves soaking a glued-up panel in room-temperature water for 4 hours, and then drying the panel for 19 hours in a 120° oven. Testers repeat this process three times, and for the product to pass, there can be no failure of the glue joint. These glues dry without color in a tight-fitting joint. Although they won't hold up to continual submersion in water, Type II glues cure faster than other water-resistant glues and are reasonably priced.



Slow-setting epoxies have been used extensively in the boat-building industry. These glues give you an hour or more working time to adjust your workpieces. They provide excellent water resistance, and produce a strong joint. However, slow-set epoxies need 24 hours or more to cure, and these glues produce a thin, dark line at the glue joint.

Continued on page 18

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ASK WOOD

Continued from page 17

Unwarping boards (we wish!)

I have some cherry boards that are warped. Can I remove this warp without planing the wood?

— Don Hayes, Whalen, N.Y.

Don, once Mother Nature has warped a board, the only way we know to remove those twists is by flat planing the lumber. You can reduce the amount of stock lost to this process by ripping and trimming the wood into narrower or shorter pieces, as the bill of materials will allow.

Surface one side of the wood using a jointer or a smoothing or jack plane. Use a thickness planer to cut the second side parallel with the first.

We have heard rumors of steaming the wood to remove a warp, but we know of no successful attempts. Steamed wood usually rebounds slightly towards its original shape when dry. Forcing a piece of wood into a shape that it does not want to go will lead to the self-destruction of the project the board is included in.

A gritty subject

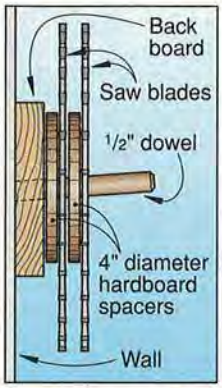
I have a number of projects that need sandblasting. Do I use ordinary contractor's sand or is there some special sand to be used?

— Ray Surowski, Murrieta, Calif.

The type of sand to use, Ray, depends on the material you're abrading and the texture you want on the finished piece. The following table from the April 1990 issue of *WOOD®* lists the types and uses of sandblasting abrasives.

NITTY-GRITTY ABRASIVE FACTS

Fine white silica sand	Glass, wood	$6-8 per 100 lb.	Best for all-around use if you have no means of retrieving abrasive. Use respirator.
Common river or beach sand	Wood, glass	$4-5per 100 lb.	Abrasive must be clean and free of debris. Use respirator. Cuts slightly slower and creates rougher texture than fine white silica sand.
Aluminum oxide	Glass, brass	$1-$3 per lb.	Use only if abrasive can be recycled. Retains sharpness through repeated applications.
Silicon carbide	Glass, brass	$1.50-$5 per lb.	Available in very fine grits. Economical only if abrasive can be retrieved and reclyed. Best retention of sharpness through repeated applications.



Super saw-blade saver

The man who sharpens my saw blades says I should not stack them on top of each other, because of damage to the teeth. Do you know of any designs I could use to keep blades apart, but wastes little space?

—Mike Layton, Holdrege, Neb.

Mike, he's right, you can damage the saw-blade's teeth when you stack the blades with nothing between them. Cut a 4- to 5"- long piece of ½" dowel, and set this in a hole drilled in a wall stud or backing board (see drawing). Cut several 4"-diameter discs from ⅛- to ¼"- thick plywood or hardboard,. Drill a ⅝" hole in the center of these disks, and place one of these spacers between each of the blades you store on this peg. Add more pegs and spacers to store additional saw blades.

How to stave off bowl-joint failure

I make stave construction bowls, mostly of oak, with a contrasting wood between the staves. Occasionally, a bowl will come apart at one of the joints. I seem to recall hearing that certain shapes will build up a tension while being turned. Can this be why my bowls are coming apart?

—Roger F. Bratt, Napa, Calif.

We suspect, Roger, that the problem lies in the bowl lamination rather than as a result of tension caused by the shape of the turning. The reasons cracks develop in laminated pieces include: joints that were forced together, improperly cured wood, cross-grain lamination, or combining woods of greatly varying rates of moisture absorption. Eliminating these sources of stress will go a long way towards helping your bowls stay together.

Take the extra time and care to ensure properly fitting joints when assembling your lamination. If you need to use heavy clamping pressure to close a glue joint, you're better off starting over and recutting the ill-fitting joint.

Also, wood not properly cured will continue to move and twist while drying. Combining this with more stable cured wood can result in joint failure.

Laminating two pieces with the grain running in opposite directions also creates problems. The expansion and contraction of these two pieces of wood will be crosswise, building stress until the joint opens.

Remember, too, that different woods will absorb moisture at different rates, causing a difference in the expansion and contraction of the woods. This will place additional stress on the glue joint, occasionally causing joint failure.

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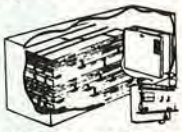

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WOOD ANECDOTE

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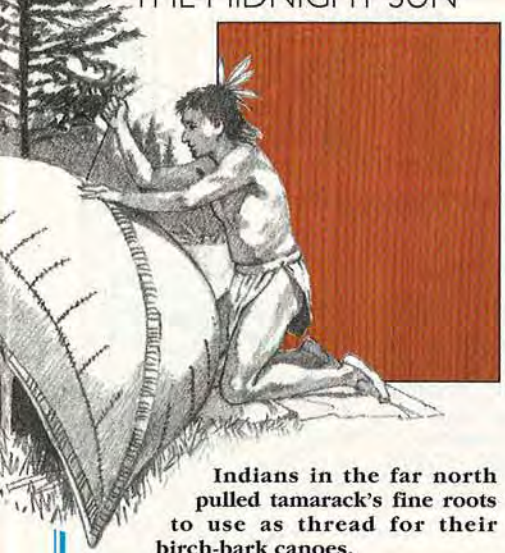
TAMARACK

ALL ALONE IN THE LIGHT OF THE MIDNIGHT SUN



Indians in the far north pulled tamarack's fine roots to use as thread for their birch-bark canoes.

Wintertime travelers in the far north—Canada's Labrador and beyond—often mistake vast stands of tamarack trees for scarred survivors of fire or disease. Brown and destitute looking, the trees starkly stand out against the snow blanket. Yet, were those same visitors to remain until spring, they would see an entirely different sight.

The tamarack (*Larix laricina*), you see, unlike all conifers except the bald cypress, looses its needles each fall. Then, in the spring, it replaces them with feathery fragments of light green that give the tree a lacey appearance. And in the most northerly reaches of its range (tamarack grows the farthest north of any tree species) it produces new "leaves" in the faint light of the midnight sun.

But even dressed in summer green, the tamarack offers little shade. With fine, sparsely spaced needles, the tamarack allows sunlight to pierce to its base.

A tree that favors sphagnum bogs and shallow swamps over high, dry land, tamarack was historically sought by Indians. They used its thinner roots for thread to sew their canoes.

When white boat builders came, they looked to the tamarack, too. But instead of thread, they sought knees—those heavier roots with angular bends that made naturally perfect braces for keels.

Because tamarack earned a reputation as tough, rot-resistant wood, it eventually was cut from its home in the bogs for railroad ties, posts, and utility poles. Since the advent of preservative treatment for nearly any wood, though, the hard-to-harvest tamarack has been left to stand alone in the otherwise treeless north.

Illustration: Jim Stevenson

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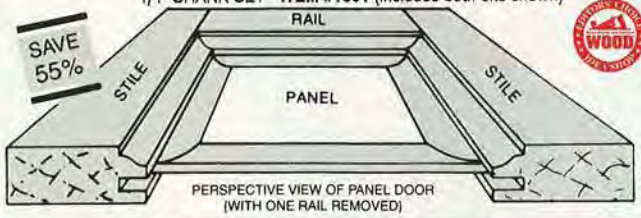

PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

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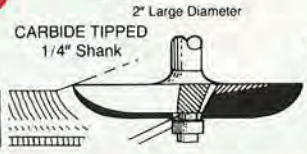

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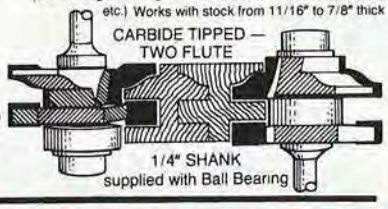

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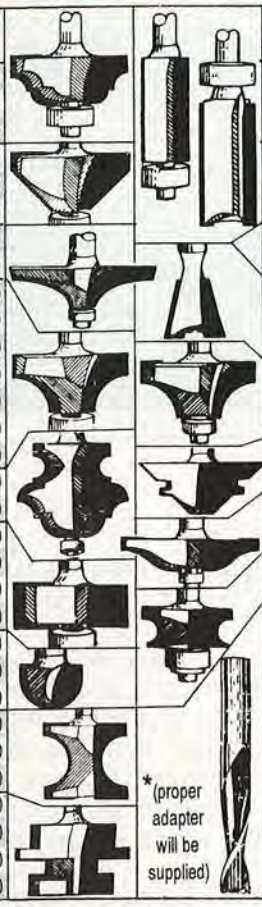

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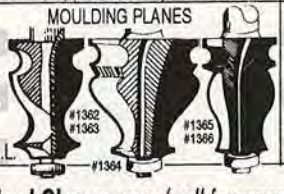

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HACKBERRY

The wood you could call "poor-man's ash"

Historically, North American tree species received colorful, descriptive names from the Native Americans who first encountered them. In turn, the colonists early on either adopted those names or chose their own for the tree. Not so with the hackberry. Records from the period make no mention of the even then abundant tree.

Maybe it was because hackberry, although a member of the elm family, doesn't look much like an elm. Even its leaves more closely resemble the nasty nettle weed. And its wood, despite being fairly easy to work, was long ignored. Eventually, though, someone called the tree hackberry, and the species at least had a title, if not respect. Today, hackberry still is one of the most neglected hardwoods in North America, but for little explainable reason.

Hackberry's first commercial role was as hoops for barrels because of the wood's toughness and flexibility. Now, though, the wood becomes kitchen cabinets, inexpensive furniture, and inevitably, boxes and crates. Increasing demand for it as a substitute for more costly white ash has increased hackberry's volume in the marketplace.

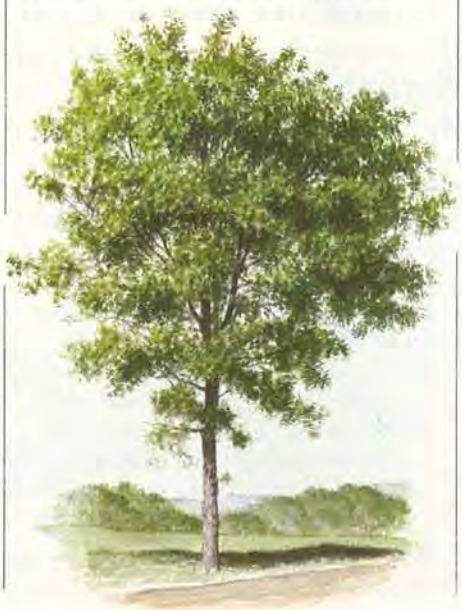
Wood identification

Actually, there are four hackberry species in North America, all looking a lot the same. The common hackberry (*Celtis occidentalis*) has the greatest range, but a southern hackberry, called sugarberry, produces the most commercial lumber. But the characteristics of each hackberry species remain the same. In fact, they are mixed and sold together.

Hackberry grows best in the thick forests of the bottomlands. In fact, along the Mississippi River, specimens nearly 4' in diameter and 120' tall have been recorded. In other areas, hackberry may only attain half that size.

Recognizng hackberry isn't difficult. Just look at the bark. Ranging in color from light brown to silvery gray, it usually features ridges and rough, irregular warts. And in summer, hackberry carries 2-4" long, roundish, tooth-edged leaves that end in a sharp point. Small purple, cherrylike fruits (edible by birds) that ripen in the fall.

At 37 pounds per cubic foot air-dried, hackberry wood weighs about the same as black walnut and is nearly as hard but not as strong. Yet surprisingly, it outranks walnut in shock resistance.



Natural range

The color of hackberry ranges from creamy white (sometimes with a grayish cast) to a light yellowish tan, with no sharp contrast between heartwood and sapwood. Its grain resembles ash.

Uses in woodworking

Hackberry may look like ash, but it's not as rugged. However, you can use it for furniture such as chairs and tables, and for cabinets, too. You can carve hackberry, but its coarseness isn't very appealing. Woodturners might reject it for the same reason.

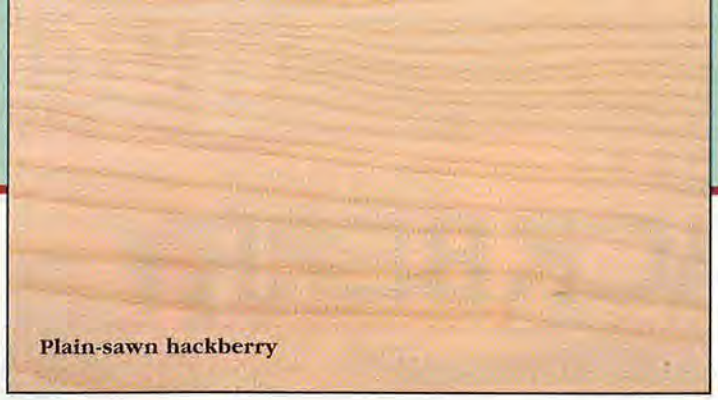
Availability

Although hackberry's commercial volume has steadily risen over the years, don't expect to find it at a typical retail outlet. The demand just isn't there yet. But local mills within hackberry's range carry it, and large hardwood suppliers can special order the wood. Expect to pay about $1.50 per board foot or less. Veneer isn't available except to the architectural trade.

Continued

hackberry

(Celtis occidentalis)



Plain-sawn hackberry

According to a spokesman for a major hardwood producer that processes 10 million board feet of hackberry annually, the wood has only one fault. But it's one you should look out for. Unless harvested in winter when the sap is down, hackberry has the tendency to develop a bluish-gray stain. And, says our source, you might not notice it on the surface of rough-sawn stock until planing. But, the stain does not harm the wood in any way, and like the varying hues in yellow poplar, it does have its own appeal.

Should you desire light-colored stock without stain, be sure to buy only surfaced (S4S) stock, and carefully inspect it. Then, follow these suggestions for working this under-appreciated wood:

Machining methods

- Although not nearly as hard as white ash, hackberry does have a blunting effect on cutting edges, so opt for carbide cutters.
- Hackberry has irregular grain. Sometimes the grain runs straight and then again it can be interlocked. When you run into interlocking grain, plane it at a slight angle to avoid tearout.
- Don't force-feed this somewhat dense wood when ripping, as it will burn. And use a rip-profile blade with at least 24 teeth.
- Watch grain direction when jointing this wood. To avoid tearout, the jointer knives should follow the grain direction.
- Because hackberry burns and chips almost as easily as white ash, be sure to take shallow passes with your router. And on end grain and cross-grain cuts, use a backing board.
- Don't skip grits when sanding hackberry, as it easily scratches.
- Drill this wood only with brad-point bits, and lift the bit from the hole occasionally to clear it or you'll burnish and burn the stock.
- Plan on white glue for joining because like ash, hackberry absorbs glue slowly. You'll want plenty of open time.
- Staining hackberry won't cause you any problems, unless you have to compensate for blue-stained wood by going lighter in those areas.

Carving comments

Unlike the much harder white ash, hackberry will yield to carving tools if you like its look. To tackle it, try these tips:

- Deeper bevels of 25-30 degrees will cut better in rough-in work. Then switch to 15-20 degree bevels for finer cuts.
- Avoid splinters along straight grain by taking shorter strokes and using stop cuts.

Turning tricks

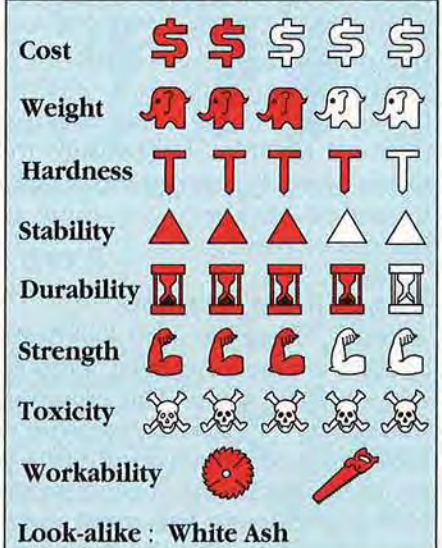
Should you decide to turn hackberry, take shallows cuts to avoid splintering, and make them with sharp tools.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and tips pertaining to this issue's featured wood species—appear under other headings elsewhere on this page.

- For stability in use, always work wood with a maximum moisture content of 8 percent.
- Feed straight-grained wood into planer knives at a 90-degree angle. To avoid tearing, feed figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".
- For clean cuts, rip with a rip-profile blade with 24-32 teeth. Smooth cross-cutting requires at least a 40-tooth blade.
- Avoid using twist drills. They tend to wander in the wood and cause breakout. Use a backing board under the workpiece to reduce tearout.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits and take shallow passes to avoid burning.
- Carving hardwoods means fairly shallow gouge bevels—15 to 20°—and shallow cuts.

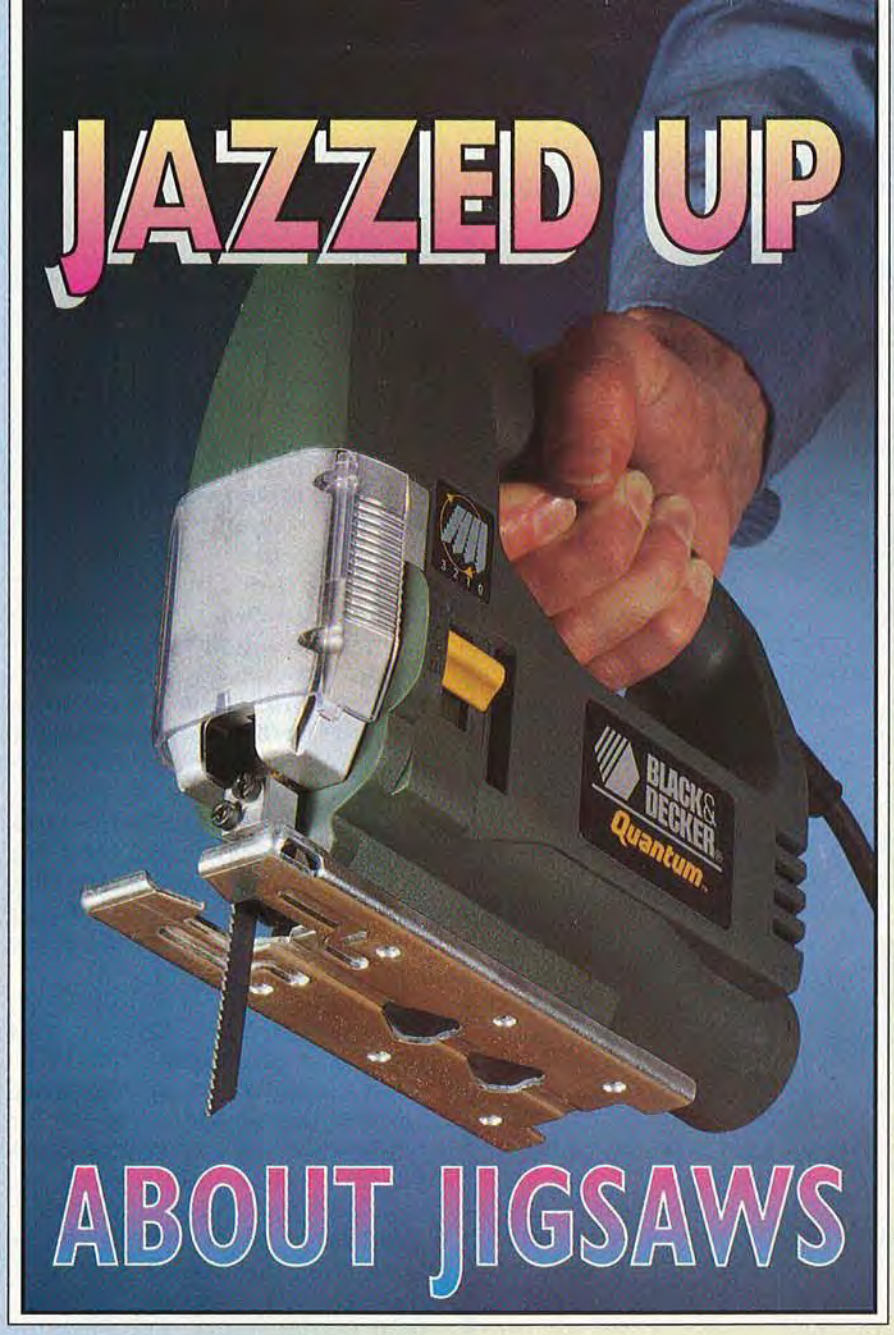
HACKBERRY AT A GLANCE



Look-alike : White Ash

Compiled with woodworkers James Price and JimWatson Illustrations: Steve Schindler

JAZZED UP ABOUT JIGSAWS



We test the best of a new generation

Hey woodworkers! If you still think of jigsaws as blade-breaking, splinter-making tools you use only when circumstances leave you no choice, have we got good news for you. Now, any one of these new and improved tools can serve as a powerful ally in your workshop.

Print this article

Power: How much is enough for you?

In our tests, the jigsaws that ran at more than 3.5 amps felt plenty powerful, even in stock thicker than 1". The amperage on these jigsaws ranged from 2.5 amps for the Sears 17211 to 6 amps for the Makita 4302C. If you cut thick materials on a regular basis, the extra power comes in handy. The speed with which these saws cut varied plenty, but keep in mind that the blade stroke length and the reciprocating action also affect a jigsaw's cutting speed.

Vibration: Smooth action leads to better cuts

All jigsaws vibrate. The best ones purr with smooth efficiency, while the less-expensive saws tend to rattle your hand. Excessive vibration roughs up your cuts and makes following and cutting a line difficult. See the chart on *page 29* for the models that scored the highest grades in this category.

The saws with the least vibration have sealed ball bearings, machined (rather than stamped) steel parts, sturdy support of the reciprocating shaft, and extra steel or plastic surrounding the bosses that hold the housing screws. Take a look at the Jigsaw Anatomy drawing on the next page for a better understanding of the tool's parts.

Blade speed: different strokes for different tasks

For cutting wood, you'll rarely need to vary from a speed of 3,000 to 3,200 strokes per minute (spm). For delicate cuts in wood

Continued

We tested these jigsaws

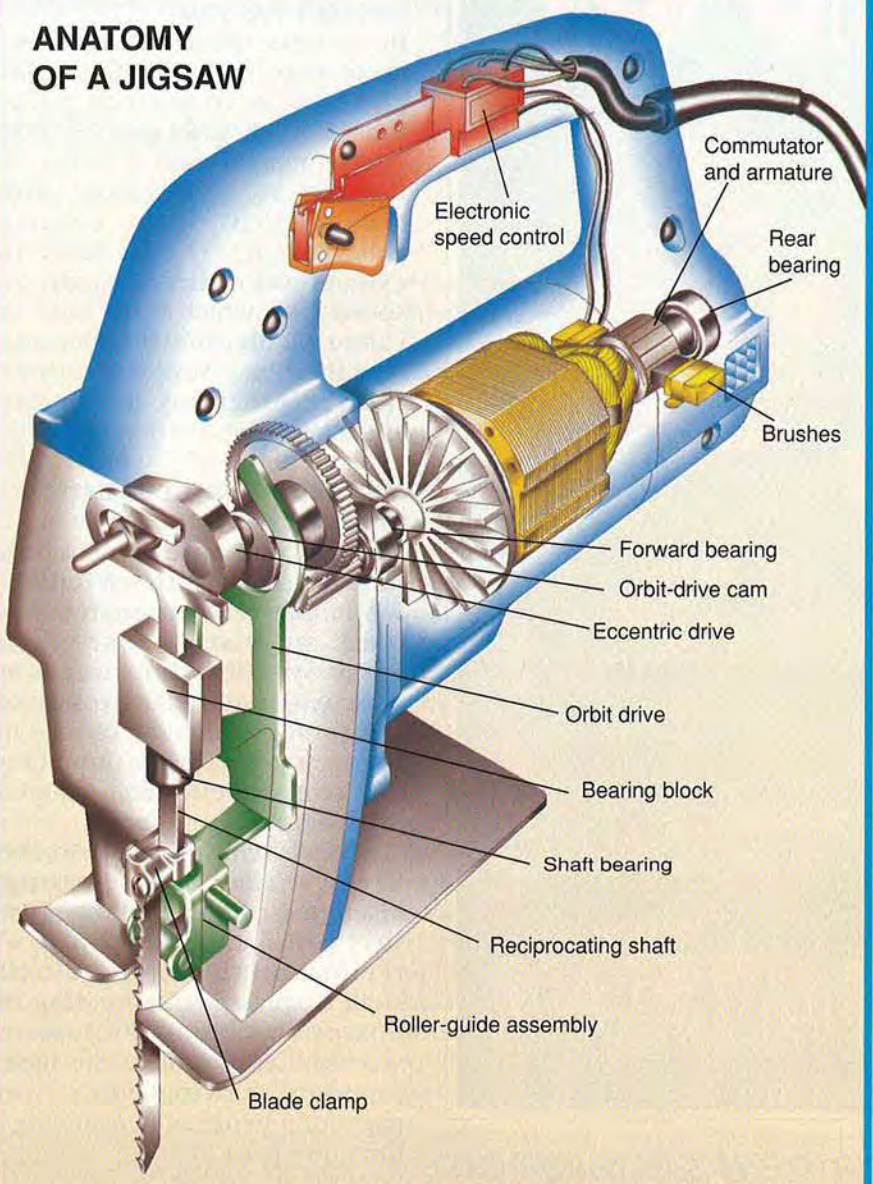
AEG
BSPE 100X

Black & Decker
7588

Black & Decker Quantum
BD4200

JAZZED UP ABOUT JIGSAWS

ANATOMY OF A JIGSAW



This cut-away view of the Porter-Cable saw shows how the eccentric drive converts the circular motion of the motor into the up-and-down motion of the reciprocating shaft . Orbital action comes from the orbit-drive cam pushing down on the orbit drive, which in turn kicks the roller-guide assembly and the blade forward.

and when cutting other materials such as plastics, foam, metal, and ceramics, you'll want to slow down the speed. Variable-speed jigsaws give you this option.

Some models allow you to slow all the way down to 0 spm—a nice feature when you're starting a cut in brittle material such as tile. With others you have to set a fixed bottom-end speed, usually around 500 to 800 spm.

The method by which you change the speed on these saws can make a big difference in how you use the tool. On some saws you vary the trigger pressure—squeeze hard to increase speed, back off to slow down. Others require you to set a dial on the body of the saw and then stick with that speed throughout the cut. The most versatile arrangement combines a speed-limiting dial mounted on a variable-speed trigger switch.

Blade guides: Don't get bent out of shape

Most saws today use hardened steel roller guides behind the blade about ½" above the work surface. These guides relieve stress on the reciprocating shaft and bearing block, help keep the blade from skewing or bending in difficult cuts, dampen the vibration of the blade, and provide blade support throughout the length of the cutting stroke. The guides also kick the blade forward when you have the saw set on orbital action. AEG and Porter-Cable jigsaws gain an extra measure of support by using adjustable bandsaw-like guide blocks on the sides of the blades

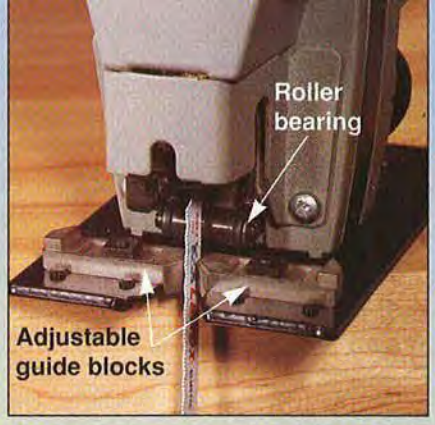
Bosch
1581 DVS

DeWalt
DW318K

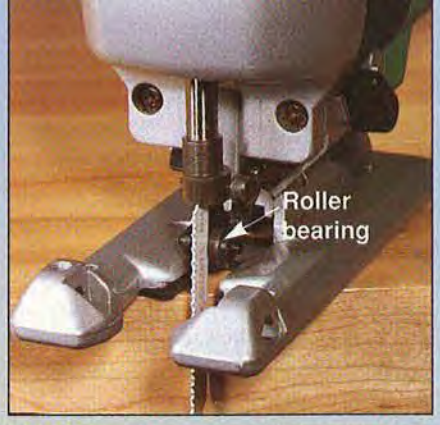
Hitachi
CJ65V2

Makita
4302C

Makita
4320



Blade support comes from two devices on the Porter-Cable saw: adjustable guide blocks and a roller bearing behind the blade. The guide blocks also help reduce splintering.



Roller bearings, like the one on this Hitachi saw, are standard on the more expensive saws. They minimize blade skew and kick the blade forward during an orbital-type cut..

Because it has no roller bearing, you can actually turn the blade on this Sears 17211 saw for auto-scrolling, but the lack of support results in more blade skew on curves.

Stroke length: the longer the better

A longer stroke puts more teeth in contact with the material and clears out debris better. For example, a saw with a ¾" stroke, cutting a ½" board at 3,000 spm with a 10-teeth-per-inch blade, will put just 13 teeth in contact with the wood and make 39,000 cuts per minute. A jigsaw with a 1" stroke puts 15 teeth in contact with the material and churns out 45,000 cuts per minute.

Orbital action: for fast, aggressive cutting

Another useful development in many jigsaws, orbital action, increases the cutting speed. In an orbital sequence, the roller guide kicks the blade forward so that the blade cuts at a slight angle on each upstroke, as shown in the drawing at *left*. At the end of the upstroke, the blade returns straight down, allowing sawdust to fall free and helping to cool the blade. Running your saw with the orbital setting on will leave a slightly rougher cut and give you less control. But in our tests, the more powerful saws, on full orbit, could crosscut a nominal 2×8 in less than six seconds. We found this aggressive cutting handy for rough carpentry. See our chart for a comparison of cutting speeds.

Dust collection: breathe easier and clean up less

The AEG, Bosch, and Black & Decker Quantum jigsaws come with vacuum-assist dust collection as a standard feature. Hitachi offers dust collection as an option.

On these saws, a clear shield traps and directs dust toward the vacuum port. The Bosch and Black & Decker Quantum use large, full-cover shields that we found more effective than the smaller, tapered shield on the AEG saw. Each shield, however, required regular cleaning.

With dust collection, your vacuum hose may sometimes get in the way during tight scrolling, but even so, the benefits far outweigh the hassle. All the saws, with or without dust collection, run with a kerf blower—no need to blow the sawdust away from the line.

Top vs. barrel handle: to each their own

Most of the heavy-duty jigsaws are offered with either a top- or barrel-type handle. The choice is largely a matter of personal preference. We found that top handles let you lean over the jigsaw to better see the line you're cutting, and they're more controllable when you have only one hand to hold the saw. The barrel handles require you to position yourself behind the blade and, in some circumstances, use two hands for control.

For us, the barrel grip handles *(left)* work best when we guided them with both hands.

Top handles *(right)* gave us better control when we needed one hand to hold the work.

Continued

Metabo
EP 565

Milwaukee
6256

Porter-Cable
7549

Ryobi
JS0-45

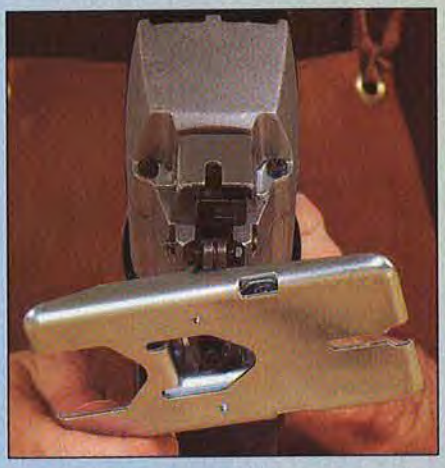
JAZZED UP ABOUT JIGSAWS

Baseplates: Check these out carefully

Remember three things when you examine a baseplate on a jigsaw. First, the size of the opening where the blade passes through the plate should be small enough that you have some support when cutting close to an edge, but wide enough that you can see the line you're cutting. The DeWalt, Ryobi, and Sears 27251 solve this problem with reversible baseplates. One end sports a narrow opening for edge work and fine scrolling, the other end offers a large opening for clear visibility.

Second, give the baseplate of any saw you want to buy a twist test. Hold the saw (unplugged, of course) so that the bottom of the baseplate faces you, and try to twist it to the right and left. The baseplate should not move. If it does, it can throw off your accuracy when you work with a fence.

And third, if you want a tilting baseplate, make sure it locks down tightly. With the exception of the Porter-Cable, all of the baseplates tilt from 0° to 45°. Porter-Cable fixes its baseplate flat at 0° and says that so few woodworkers ever bevel-cut with a jigsaw that they've opted for the security of a baseplate that can't creep or get knocked out of alignment.



A narrow blade opening obscures the line, but a wide opening can leave you without support. The DeWalt, Ryobi, and Sears 27251 saws solve this problem with a reversible baseplate.

Blade-changing: faster than you ever thought possible

AEG's blade-changing system proved to be the easiest to operate. To use it you push a lever on the front of the jigsaw, insert the blade, and let the lever spring back. On the updated version of the Bosch jigsaw, the "Clic" quick-change system enables you to rotate a knob on top of the handle, then just pull the blade out. Another nice feature we discovered about the quick-change systems is that they lock the blade more securely than other methods. To change blades on the other jigsaws you have to take a little more time to tighten either a slotted screw or hex-head screw.

Auto-scroll: cuts corners when you're boxed in

The Black & Decker 7588, Skil 4395, and the Sears 17211 offer an auto-scrolling feature that enables you to turn the blade without turning the body of the saw. This feature comes in handy when you're cutting up to a wall or inside a cabinet and you don't have much room to turn the saw. But to get this feature you give up the blade roller guides and the support they provide. For working on new projects, this feature may see little, if any, action.

Auto-scrolling comes in handy when you're in a tight corner.

You'll find three different types of blade tangs on the market. From left to right: Porter-Cable's, universal, and bayonet. See the chart at *right* to find out which saws take which type of blade.

Sears 27251

Sears 17211

Skil 4580

Skil 4395

COMPARING JIGSAWS: SPECS AND PERFORMANCE

MANUFACTURER/ IMPORTER	MODEL	MOTOR				CUTTING SPEED (1)		SPEED CONTROL		BLADES			PERFORMANCE (6)													
		AMPS	ORBITAL ACTION (YES, NO)	STROKE LENGTH (INCHES)	STROKES PER MINUTE	SPEED OF CUT NON-ORBITAL	SPEED OF CUT ORBITAL	TYPE (2)	ELECTRONIC (YES, NO)	BLADE TYPE (3)	BLADE LOCK (4)	BLADE SUPPORT (5)	CONTROL OF CUT	QUALITY OF CUT	VIBRATION	PLUNGE CUTTING	OVERALL PERFORMANCE	CORD LENGTH	DUST CONTROL (7)	ANTI-SPLINTER INSERT (YES, NO)	HANDLE TYPE (8)	WARRANTY, YEARS (9)	COUNTRY OF ORIGIN (10)	LIST PRICE	SELLING PRICE (11)
AEG	BSPE 100X	5.7	Y	1	450-3100	9.7	5.3	D	Y	B	A	RG	E	E	E	E	9	10'	KB/VA	Y	T*	1	G	$302	$165
BLACK & DECKER	7588	3.5	N	11/16	800-3200	53.6	--	D	Y	U	FB	--	F	F	F	F	6	6'	KB	N	T	2*	E	102	55
	QUANTUM BD4200	3.5	Y	3/4	800-3200	23.7	8.5	D	Y	B, U	FB, HK	R	E	G	E	G	8	8'	KB/VA	Y	T	3*	U	175	95
BOSCH	1581 DVS	4.8	Y	1	500-3100	9.8	5.5	D	N	B	FB	R	E	E	E	E	10	6'7"	KB/VA	Y	T	1	S	295	169
DeWALT	DW318K	4.5	Y	1	0-3100	9.5	5.3	T/D	Y	U	HK	R	E	E	G	E	8.5	8'	KB	N	T	1	U	258	149
HITACHI	CJ 65V2	5.2	Y	1	700-3200	9.0	5.0	D	Y	B, U	HK	R	E	E	E	E	9	8'	KB	Y	T*	1	J	300	175
MAKITA	4320	2.9	N	11/16	0-3200	48.6	--	T/D	Y	U	HK	R	G	F	F	F	7	8'	KB	N	T	1	J	156	84
	4302C	6.0	Y	1	1000-3000	9.7	5.0	D	Y	B, U	HK	R	E	E	E	E	9	9'	KB	N	T	1	J	351	194
METABO	EP 565	5.0	Y	1	500-3000	12.2	5.3	D	Y	B, U	HK	R	E	E	E	E	9.5	8'	KB	Y	T*	1	G	--	275
MILWAUKEE	6256	3.8	N	1	0-3100	11.7	--	T/D	N	U	FB	R	E	E	G	E	8.5	8'	KB	N	T*	U	U	264	155
PORTER-CABLE	7549	4.8	Y	1	500-3200	8.6	5.6	D	Y	PC, B, U	FB	RG	E	E	G	E	9	7'	KB	Y	T*	1	U	260	159
RYOBI	JS0-45	3.0	Y	5/8	0-3000	52.1	28	T/D	N	U	HK	R	G	F	P	F	5	6'	KB	N	T	2	U	156	82
SEARS	17211	2.5	N	3/4	0-3000	60.4	--	T/D	N	U	HK	--	F	F	P	F	5	10'	KB	N	T	1	U	--	80
	27251	4.5	Y	1	0-3100	9.5	5.3	T/D	N	U	HK	R	E	E	G	E	8.5	8'	KB	N	T	1	U	--	140
SKIL	4395	3.2	Y	5/8	0-3200	44.6	22	T	N	U	HK	--	F	F	P	F	5	5'	KB	N	T	1	U	78	67
	4580	3.5	Y	13/16	0-3200	20.7	9.7	T	N	U	FB	--	G	F	G	F	7	8'	KB	N	T	1	U	162	109

NOTES:

1. Test indicates the number of seconds it took to crosscut a piece of 2x8" pine.
2. (D) Dial operated
   (T) Trigger operated
   (T/D) Combination trigger and dial control
3. (B) Bayonet
   (U) Universal
   (PC) Porter-Cable
4. (A) Automatic clamp lever
   (FB) Flat-blade screwdriver
   (HK) Hex key
5. (R) Roller wheel
   (RG) Roller wheel and guide blocks
6. E Excellent
   G Good
   F Fair
   P Poor
7. (KB) Kerf blower
   (VA) Vacuum assist
8. (T) Top grip
   (*) Also avilable in barrel grip
9. (U) Unconditional lifetime warranty against defects in workmanship or material.
   (*) Warranty covers home use only.
10. (E) England
    (G) Germany
    (J) Japan
    (S) Switzerland
    (U) United States
11. Selling price based on catalogs and dealer inquiries.

Our recommendations

For its smooth cutting, durable construction, and ease of use, the Bosch 1581 DVS turned out to be our favorite. (Bosch recently upgraded this jigsaw to 5 amps and renamed it the 1587 DVS. That's the new saw on the cover of the magazine.) The AEG, Hitachi, Makita 4302C, and Metabo jigsaws came in close behind, and right on their heels were the DeWalt, Milwaukee, Porter-Cable, and Sears 27251.

We found so little difference in overall performance between these saws, however, that we suggest you shop for price and features. Consider dust collection if you want a clean shop, power and orbital action to cut thick lumber, or a quick-change blade-locking system for convenience.

If price is no object, the Metabo saw is ruggedly built to withstand the daily rigors of a production woodworking shop. Metabo only sells through select dealers, so if you can't find its tools, write to the company at P.O. Box 2287, West Chester, PA 19380, or call 800/638-2264.)

But if you're on a tight budget, you needn't avoid the less powerful saws. Of these, we think the Black & Decker Quantum BD4200 offers the best value for the money. It gives you components that match the sophisticated engineering of the more-expensive jigsaws and plenty of power for home-shop needs.

Written by Tom Jackson Testing consultant: Bob McFarlin Photographs: John Hetherington Illustrations: Kim Downing

A NIFTY NEEDLE CASE TO TURN

Print this article

JUST SPOLIN'

Just another wooden thread spool? Not quite! Astound your sewing friends and relatives by popping off the spool's end to reveal a handy storage spot for needles and pins inside.

We used these tools and supplies

Stock

2×2×6" maple or birch

Lathe tools and equipment

Screw chuck
Cone-point live tail center
Roughing gouge, ¾"
Spindle gouges, ¾", ¼", ½"
Skew, ½"
Parting tool, ⅛"

Lathe speeds

Roughing: 800 rpm
Turning, sanding
1200–1500 rpm

Locate and mark the center on each end of a 2×2×6" turning square (we used maple). At the center on one end, drill a 3/16" hole ¾" deep. Center a pilot hole for your screw chuck at the other end of the blank.

Mount the stock with the screw chuck at the drive end and a cone-point revolving center at the tailstock. Place the tail center's point into the 3/16" hole.

Start with a simple spool

Round the stock to 1⅜" diameter, using the roughing gouge or a spindle gouge. With the lathe running, hold a pencil point against the workpiece to draw a line around it ⅜" from the tailstock end. Make another mark 3" from the first line, as shown in the Layout Marks drawing. Then, mark ¼" inside each line.

With the parting tool, cut in about ¼" deep on the outside of the outer lines, where shown by the number 1 in the Parting Cuts drawing. These cuts mark the ends of the spool. Next, part in on the inside of the inner lines to delineate the spool's central cylinder and establish its diameter (cut 2). Cut in to a diameter of 1 1/16".

Turn the central cylinder to diameter with a gouge or skew. For a true cylinder, set your caliper to 1 1/16", then check the cylinder's diameter at each end and at random points along its length.

Now, form the chamfer on the inside of each end flange. First, draw a line around the flange at the tailstock end, ⅛" from the end of the spool. Then, with the long point of a narrow skew, cut the chamfer between that line and the cylinder, where shown in the Forming Flanges and Lid Tenon drawing. Repeat at the other end of the turning.

Sand the spool with 150-, 220-, and 320-grit sandpaper. Round over the edges of the flanges slightly for a softer, worn look.

Turn an end into a lid

Form the lid for the needle case at the tailstock end of the turning. First, cut in right at the junction of the bevel and the spool cylinder with the parting tool. Cut about 3/16" deep to set the tenon diameter at 1 1/16". Make an adjoining cut to form a tenon ¼" long.

Part the waste from the top of the lid,

AROUND

where shown by the first parting cut in the Forming Flanges and Lid Tenon drawing. Move the tailstock out of the way, then smooth the top surface of the lid.

With a small gouge, chamfer the edge of the center hole. Sand the lid as necessary. Separate the lid from the spool where shown by the second parting cut in the drawing. (We brought the tailstock back up to part off the lid.)

Make a space for needles

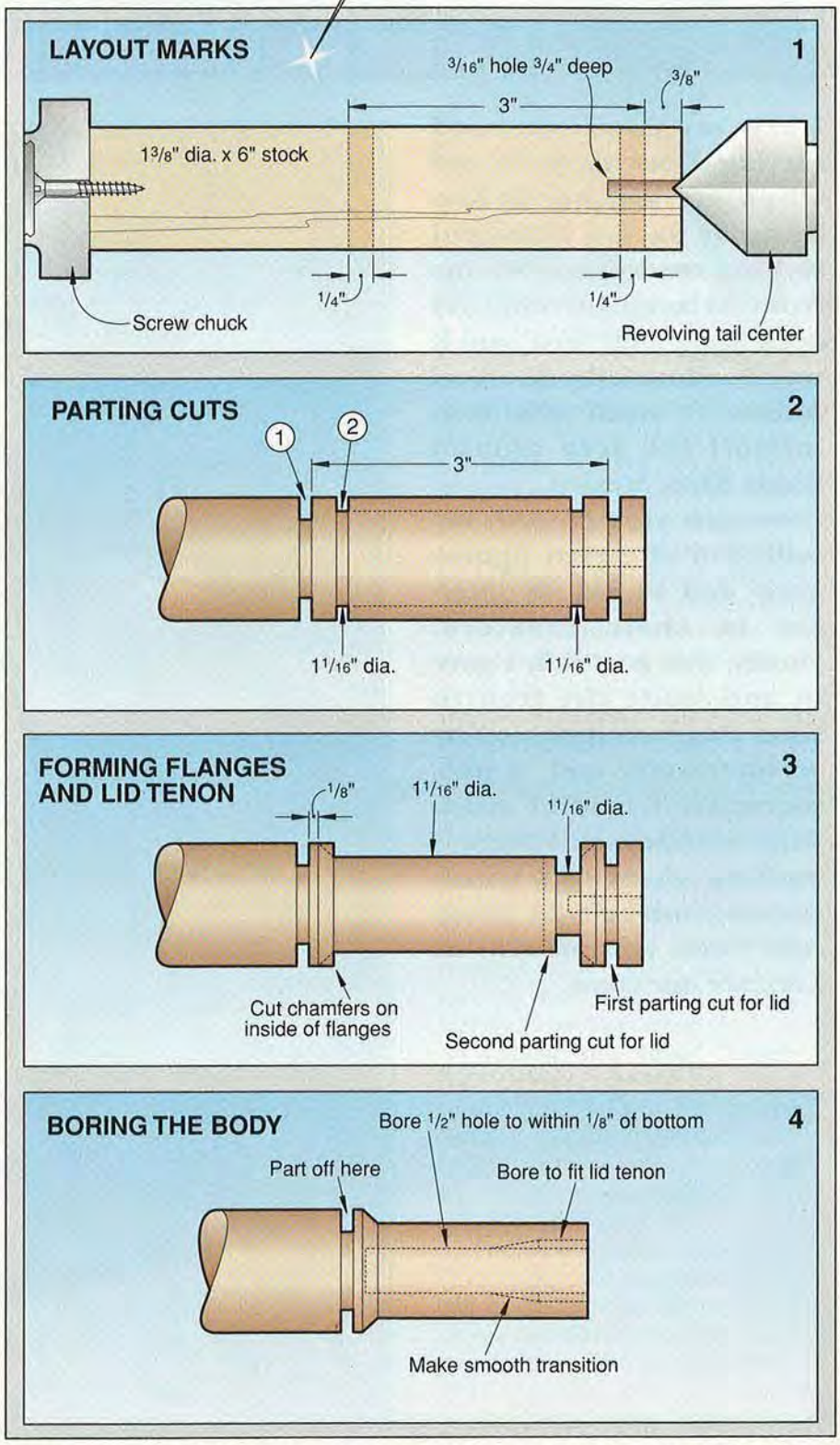
A ½" hole with a larger counterbore forms the inside of the needle case, as shown in the Boring the Body drawing. This way, the needles don't lay against the wall of the case near the lid. This makes them less likely to get stuck between the lid tenon and the sidewall. Mount a drill chuck on your lathe's tailstock, and bore out the spool body with drill bits. Or, use gouges.

First, measure your turning's overall length. Then bore a ½" hole to a depth ⅛" less than the length. (We drilled 2¼" deep into our 2⅜"-long workpiece.)

Next, measure the diameter of your lid tenon. Bore a hole slightly smaller than that measurement ½" deep. (For our tenon, which measured a little over 11/16" in diameter, we bored a ⅝" hole.)

Now, with a small gouge, carefully enlarge the bigger hole until the lid fits snugly. Taper the inside wall to create a smooth transition between the holes. Skim a light cut from the rim of the spool body to ensure a neat lid joint.

Then, part the spool from the lathe at the bottom of the flange. Sand the bottom as necessary, and finish the spool and lid.



Photographs: John Hetherington
Illustrations: Kim Downing
Project Design: Larry Johnston

WOOD® magazine travels south of the border in search

MASTER FROM MEXICO

I saw my first ironwood carving about six years ago when my mother-in-law brought back a beautiful stylized roadrunner for me from Arizona. Around its neck hung a tag that said it was handmade by the Seri Indians, a small tribe who inhabit the area around Bahia Kino, Mexico.

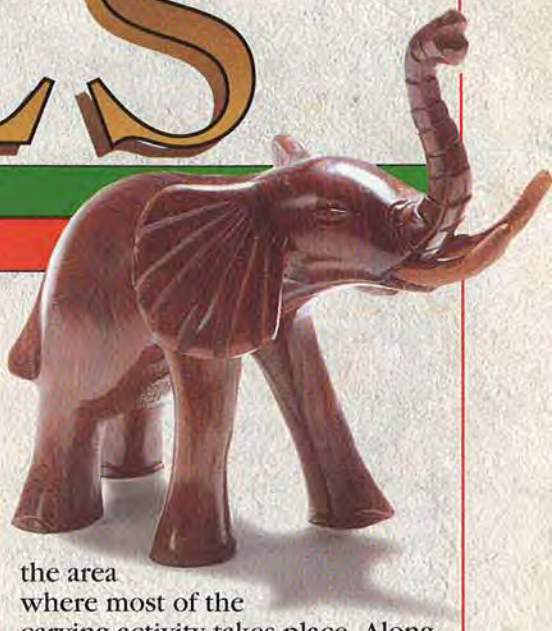
As each year passed, my collection of carved figures grew, and so did my interest in their creators. Finally, this past fall, I gave in and made the trek to Kino Bay, accompanied by an interpreter and a photographer friend of mine. What we discovered there is nothing short of a woodcarving miracle in progress. Come join me now as I retrace our steps.

Larry Clayton
Editor

Print this article

of carved ironwood "treasures."

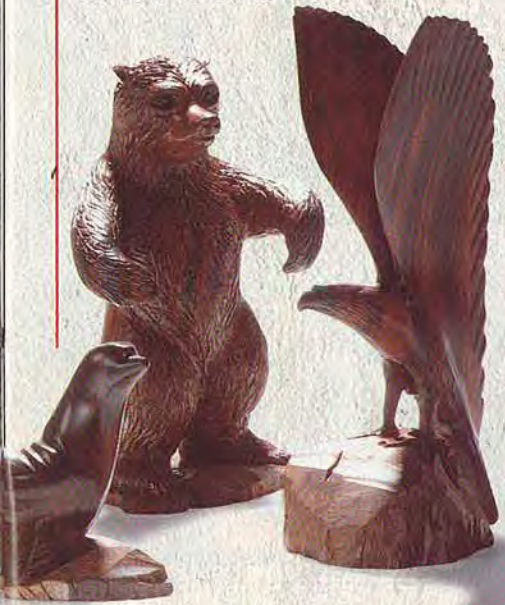
PIECES



The odyssey begins

A short time after photographer Bob Hawks and I stepped off the AeroMexico airliner in Hermosillo into the hot Mexican afternoon sun, we caught up with Jane Wyatt, our interpreter. (An American who divides her time between Tucson and Hermosillo, Jane is a professor in food and nutrition at the university in Hermosillo.) Barry Snider, my Tucson, Arizona, contact and one of the largest importers of ironwood sculptures into the U.S., had suggested that I hire Jane, and that proved to be very good advice indeed.

You see, for several years, Jane worked part-time with Barry as his purchasing agent. And as a result, she developed friendships with several of the best carvers in the Kino Bay area. This, along with her language skills, allowed us easy access to not only the Seri Indians, but also to the Mexican carvers of the area.



***Note**: Although it was the Seris who began carving in ironwood in the early 1960s, Mexican carvers have a corner on the market today. Why? It's mainly because they are willing and able to use power tools to speed up production of the carvings.*

After getting acquainted with Jane over some nachos and lemonade, Bob and I drove about an hour to Kino Bay, a typical Mexican fishing village nestled along the shores of the Gulf of California. We settled into our motel (you know, the one without the hot water!), full of anticipation about what we hoped to see the following day.

Bargaining for bowls

The next afternoon, Jane, Bob, and I made the short drive to Old Kino, the area where most of the carving activity takes place. Along the way, though, Jane noticed something she wanted us to see. We stopped in front of a small concrete building, and she went to the door. In no time, several Seri Indian women and two small children appeared, each carrying some of the most stunningly beautiful hand-woven bowls I've ever seen. They also showed us a few ironwood carvings and some gaily colored seashell necklaces.

Continued

A very brief history of ironwood carvings

The Seri Indians—historically fishers, hunters, and gatherers—began carving ironwood in the early 1960s. And it wasn't long until they (and some industrious Mexicans) realized what a good source of income their desert- and ocean-inspired carvings were.

Within a few years, though, the Seris had used up the wood in their immediate area. As the Indians' supply dwindled, they began to focus more on making finely woven baskets and seashell necklaces.

Today, a few hundred Mexican craftsmen do the bulk of the ironwood carving. A dozen or so distributors bring their products into the U.S. for sale.

A group of Seri Indian women showing off their wares, most of which are exquisitely done. It's said that some of the bowls are woven so tightly that they can hold water.

As it turns out, these native entrepreneurs know the value of their wares. Even after prolonged haggling, we managed to buy only one small bowl (it cost about $30) and a few necklaces. The women were asking from $300-400 for some of their larger works. (See the photo on *page 33*.)

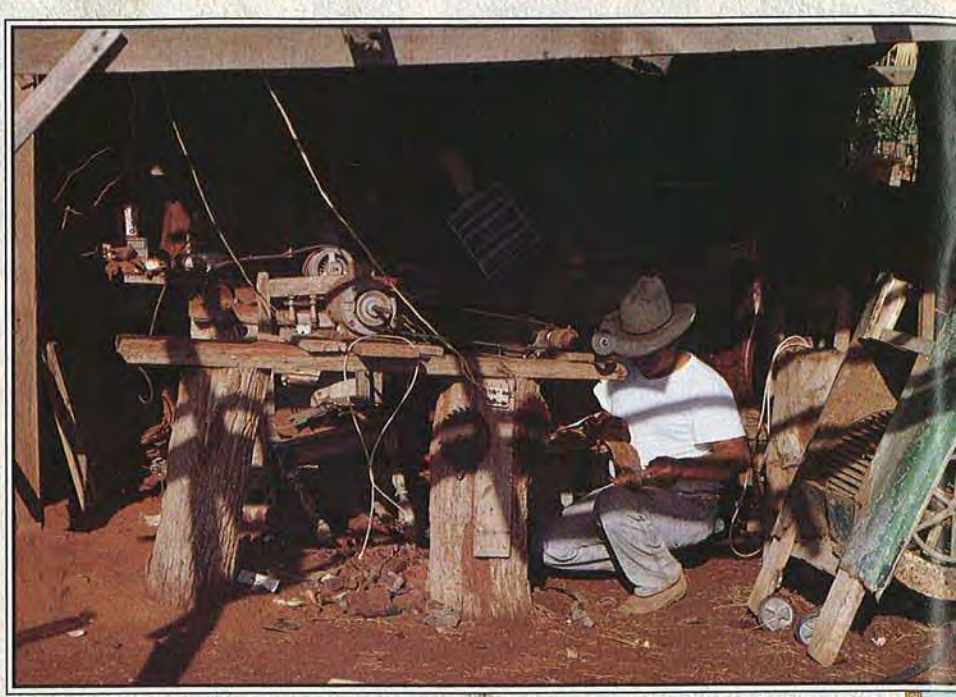
Looking for Cuco

After our shopping experience, we set out in search of Refugio Garcia (everyone calls him Cuco), a 49-year-old Mexican carver who both Barry and Jane agreed does terrific work. When we arrived at Cuco's house, Jane again did the introductions, and after a short chat, Cuco agreed to let us photograph him while he carved a 16-inch-tall sailfish.

A no-frills shop that really does the job

Cuco's shop, which sits about 100 feet behind his house, is humble by almost any standard, but it's ideally suited for the work he does. As you can see in the photo *above right*, it's a lean-to pole building that serves mainly to protect him from the sun. A couple of tree stumps and a 6- or 7-foot-long 2×12 serve as his workbench. Mounted to the bench, about midway down its length, is an old 1½-hp motor that's connected to a shaft near the end of the bench by a belt.

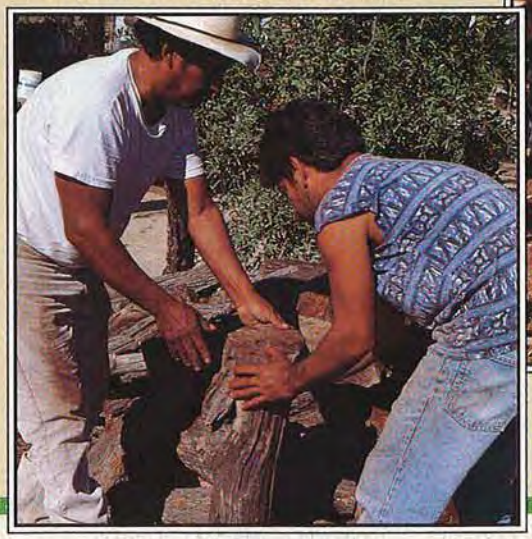
Note also the squirrel-cage fan near the workbench. When he sits down to work, Cuco turns on the fan, which helps blow the ironwood sawdust away from him.



Above: **Proof positive that it's not the shop, it's the craftsman who counts. Some of the best carvings in the world are done in these humble surroundings.**

The artist and his work...step-by-step

1 ***Right:*** **Cuco and his brother-in-law sort through a stack of ironwood, none of which looks like it would be good for anything except maybe firewood. The piece they're inspecting cost us $15.**



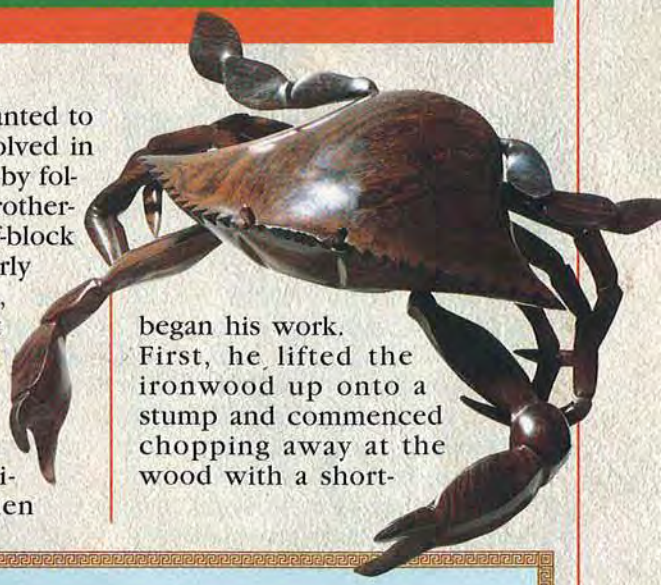
2 ***Right:*** **Here, with the help of a razor-sharp ax, Cuco spends about 10 minutes rough-hewing the blank. We watch nearby as the contour of the sailfish emerges.**

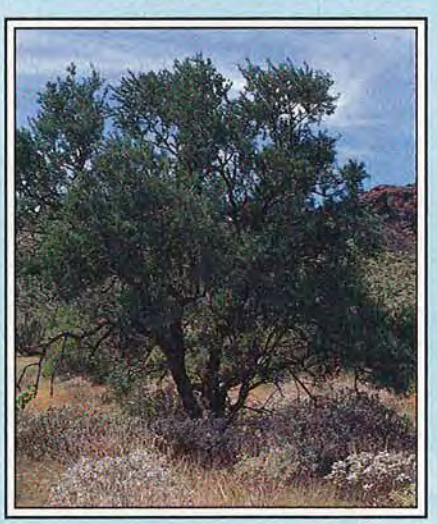
Witnessing a miracle—well almost

Chances are good that if you happened onto a piece of ironwood somewhere, you'd probably pass it by, never suspecting what beauty lies within. But Cuco, being a gifted artist and a skilled-craftsman, can coax and cajole the extremely dense, highly figured wood into shapes of rare beauty, almost at will. Of course, it helps that he's been doing it for about 30 years now.

I told Cuco that we wanted to see every step that is involved in the process, so we started by following him over to his brother-in-law's house about a half-block away. There we saw a fairly large stack of ironwood, which I later found out had cost about $400. After paying him $15 for our wood, we walked back to Cuco's place.

Acting with the confidence of a pro, Cuco then began his work. First, he lifted the ironwood up onto a stump and commenced chopping away at the wood with a short-





How ironwood is harvested and sold

According to Barry Snider, the owner of a company called JoBa and one of the largest ironwood figurine importers in the U.S., it works like this:

These carvers don't process their own wood. They buy it from a woodcutter who gets a permit from the Mexican government to harvest the ironwood.

With a permit in hand, the woodcutter searches the Sonoran desert for some dead (but still standing) trees. Mexican law prohibits cutting down live ironwood trees. The ironwood tree in the photo *at left* would be off-limits until it dies.

After harvesting, the woodcutter loads the wood into his truck and heads for Kino Bay or other nearby towns. There, he'll go up and down the dirt streets yelling "Palo fierro," the Mexican name for ironwood. The carvers come out of their houses, take a look, and if they like the quality of the wood, they will buy it then and there.

3 ***Below:*** **Even though he is an experienced carver, Cuco still takes the time to draw the profile of the sailfish on the ironwood blank. Doing this helps him proportion the fish correctly.**

4 ***Above:*** **That's an 8" carbide-tipped circular saw blade rotating at 1725 rpm within a foot of our master carver. As you might suspect, many ironwood carvers have sustained injuries doing their work.**

Continued

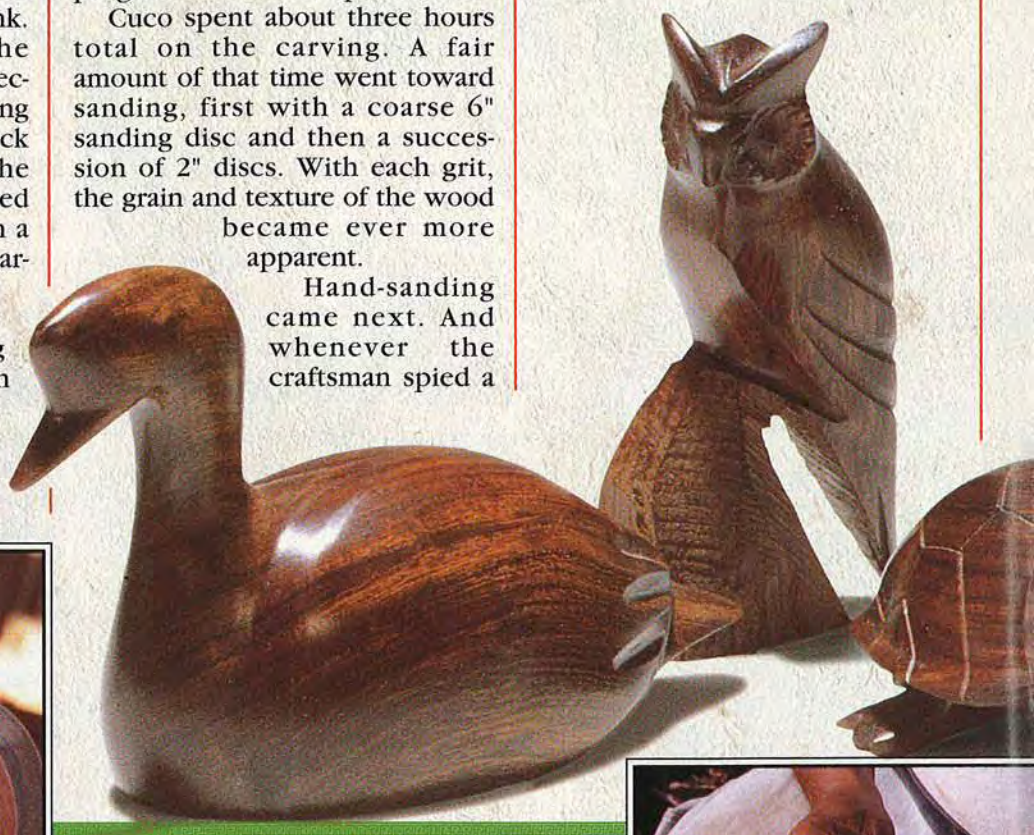
handled ax. Within about 10 minutes, it started to take on the shape of a sailfish.

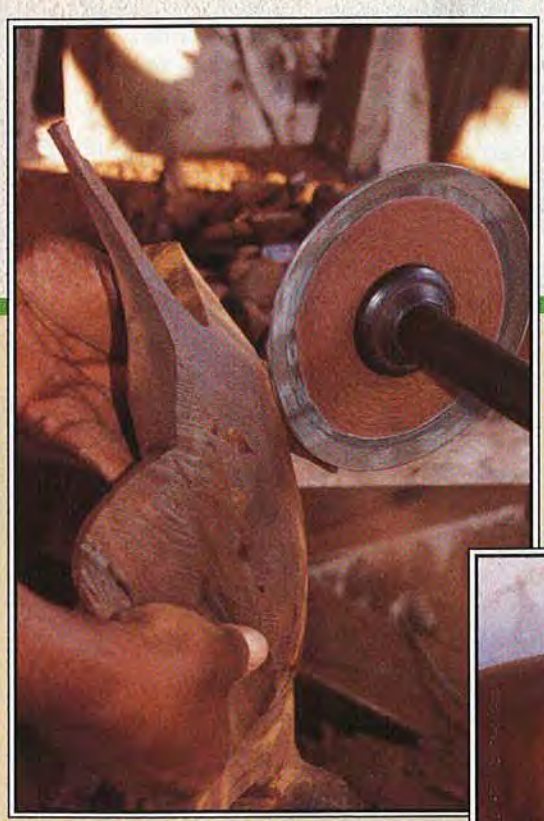
Then, using a piece of white chalk, he quickly sketched the profile of the fish onto the blank. That done, Cuco went to the workbench, switched on the electricity, pulled the belt connecting the motor to the spindle to "kick start" the motor, flicked on the squirrel-cage fan, and positioned himself in front of and less than a foot away from a whirling 8" carbide-tipped circular saw blade.

Bob, Jane, and I stood nearby for about 45 minutes watching this artist work his magic, in what can only be described as a truly dangerous dance with the spinning blade. By the time he was finished cutting, though, Cuco had skillfully transformed a pretty homely looking chunk of ironwood into a roughed-out work of art in progress. We were impressed.

Cuco spent about three hours total on the carving. A fair amount of that time went toward sanding, first with a coarse 6" sanding disc and then a succession of 2" discs. With each grit, the grain and texture of the wood became ever more apparent.

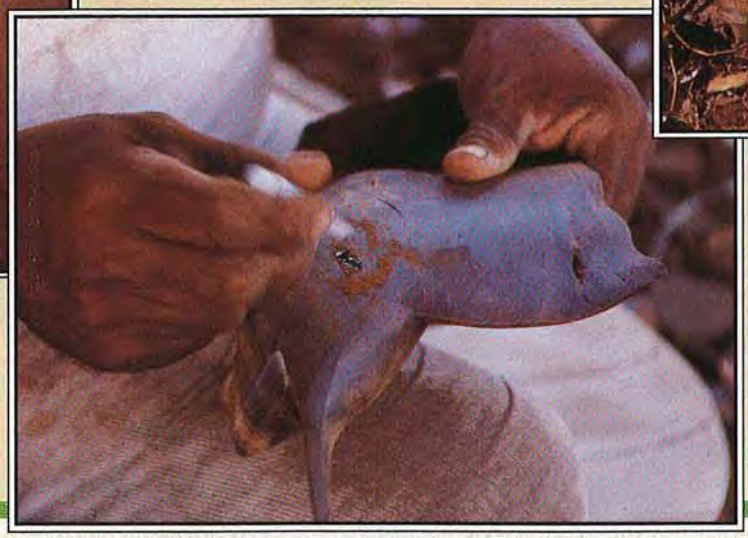
Hand-sanding came next. And whenever the craftsman spied a defect, out came the (surprise!) Super Glue. Mixed with ironwood dust, this stuff makes a great patching material that dries





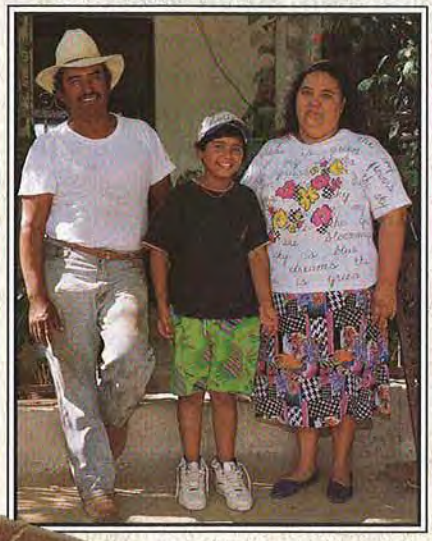
5 *Above:* **The figure goes through a series of sandings, first with a 6" disc, then with a 2" one. Cuco sands his work through 600 grit.**

6 *Below:* **For unexpected defects, Cuco uses Super Glue. Mixed with ironwood sawdust, the glue makes a fast-drying patch that our artist sands immediately after applying.**



7 *Above:* **Cuco spends a great deal of time sanding his carvings. Here, he's giving the sailfish one last light sanding with 600-grit abrasive. He depends on his squirrel-cage fan to blow away sawdust.**

Below: **Refugio Garcia (Cuco), his wife, and youngest son in front of their home in Kino Bay.**



within a few seconds. By the time Cuco had worked his way up to 600-grit, the sailfish was ready for the only finish these carvings need—one coat of brown Kiwi shoe polish.

For more details on Cuco's technique, see the step-by-step photos starting on *page A 12*.

A fond farewell to old Mexico

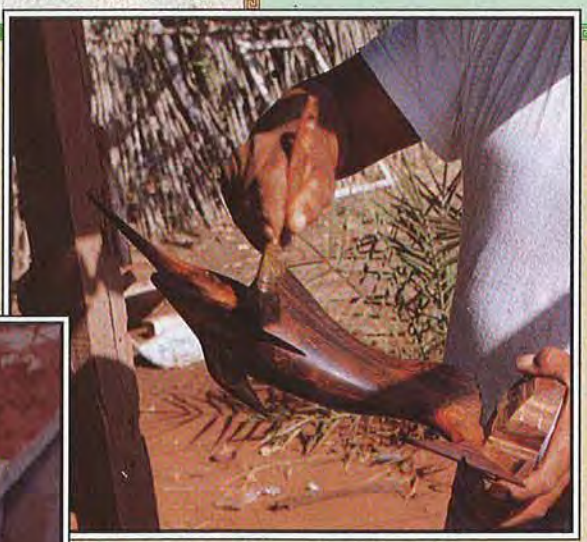
Our time in Kino Bay went by quickly, and I've got to say that this journey ranked as one of the most informative and enjoyable trips I've ever taken for *WOOD* magazine. When the time came to say goodbye to Cuco and his family, I think we all felt a closeness not normally developed in such a short time. Bob, Jane, and I all agreed that we had witnessed someone who has been blessed with extraordinary carving talent. *Muchas gracias*, Cuco, for a wonderful experience, and the best of luck to you and your family.

Written by Larry Clayton with excellent help from Barry Snider and Jane Wyatt
Photographs: Bob Hawks, John Hetherington

Want to buy some ironwood carvings?

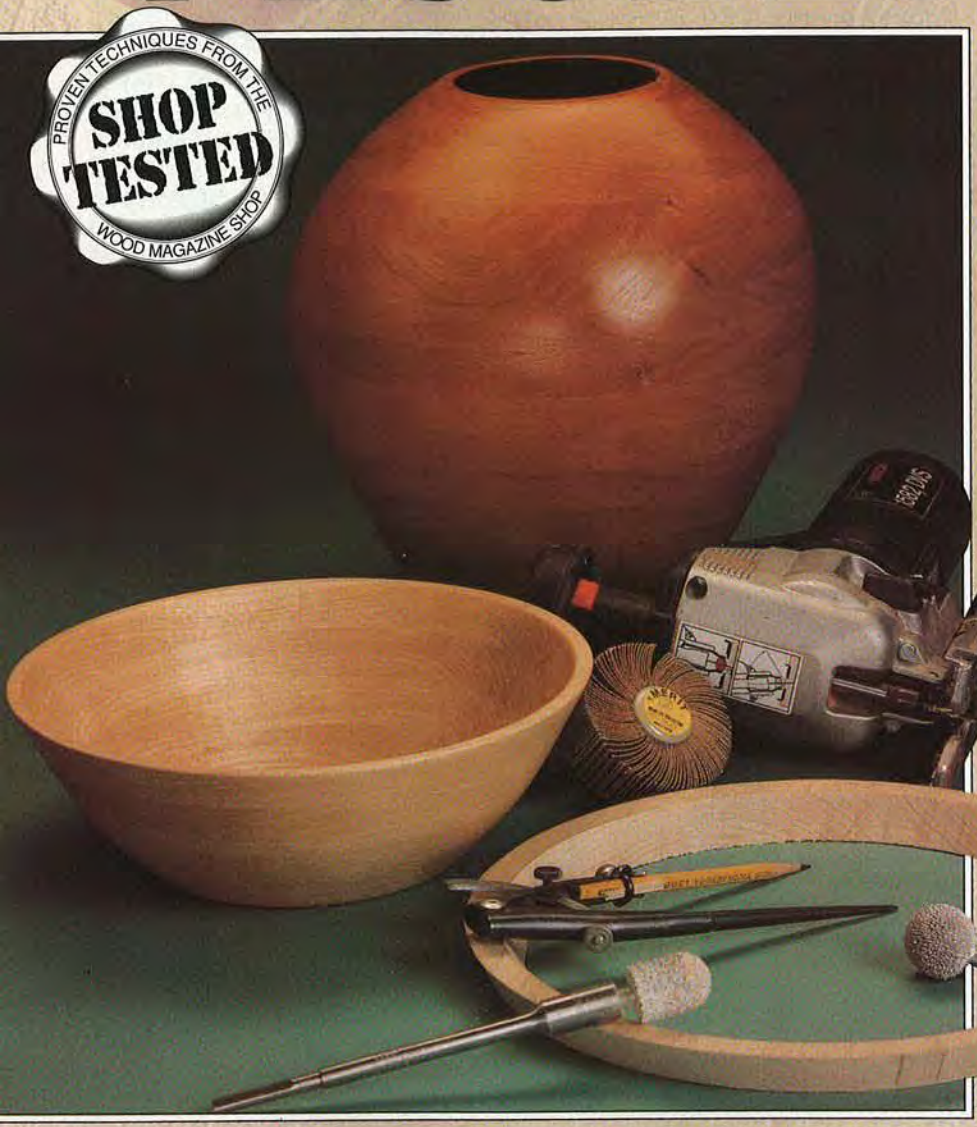
Except in the Southwest, you won't run onto many ironwood carvings. So if you want to purchase some figures, your best bet would be to call Barry Snider at 602/792-1055 or write to JoBa, 3690 South Park Avenue, Suite 809, Tucson, AZ 85713. Though he usually sells wholesale only, Barry said he will work directly with *WOOD* magazine readers. He's got a large inventory in Tucson, and if you're interested in larger pieces, he can have them custom-made for you. But keep in mind that with special orders, you'll have to wait anywhere from a few weeks to several months to receive these one-of-a-kind creations.

8 *Below:* **Always the pragmatist, Cuco carves the gills and dorsal fin freehand with a well-used Makita die grinder.**



9 *Above:* **Cuco applies brown Kiwi shoe polish as the finish for his projects. A buffing with a soft cloth brings up a deep lustre.**

STACKED-RING VESSELS



ABSOLUTELY NO LATHE REQUIRED!

If you've always wanted to try your hand at making a beautiful turned vessel, but put off the idea because you don't own a lathe, here's the article of your dreams. Now, you can make a vessel of almost any shape, in sizes larger than is possible on most lathes. All you need is a jigsaw, an electric drill, a few sanding accessories, and of course, the friendly guidance presented here.

Way back in the July 1985 issue of *WOOD®* magazine, we ran a story on Robert St. Pierre of Plymouth, Massachusetts and his laminated wooden-ring bowls and vases. At the time, we were amazed with the great results he achieved. But, until we started researching this article a few months ago, none of us on staff had any hands-on experience making vessels that way.

Actually, once we got going we found the process fairly easy. And we'll bet that even your very first effort, like ours, will yield a terrific vessel. Here's how:

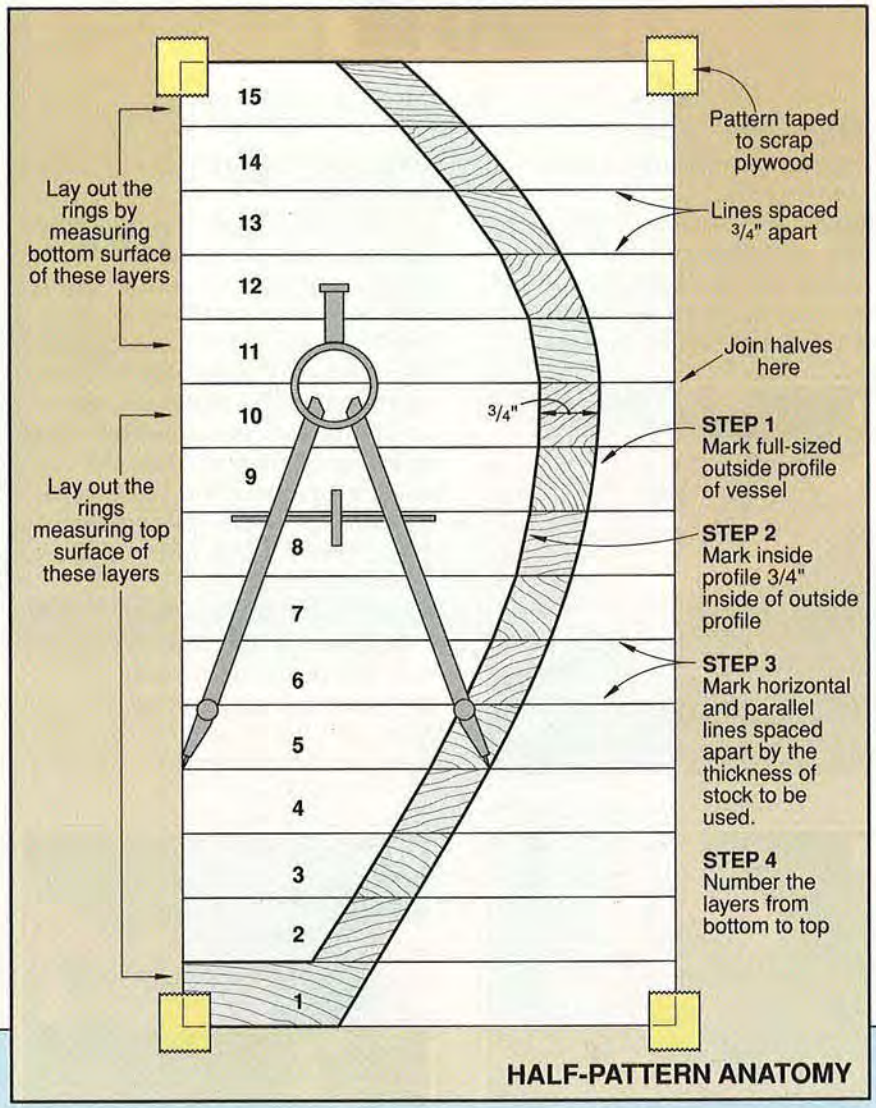
Make a pattern of your one-of-a-kind vessel

With this procedure you can make an endless variety of vessels of most any size and shape. Start by drawing a rough, full-sized sketch of the vessel you have in mind. To help you get the creative juices flowing, we've included three design variations in the drawing *right*. Keep three things in mind when doing your vessel designs:

1) The maximum diameter of your vessel should be no greater than twice the widest spread of your compass.

2) Convex surfaces on the outside of the vessel will be easier to sand than concave surfaces, and tight concave surfaces will be nearly impossible to sand. Convex surfaces should not angle more than 45° past hori-

Print this article

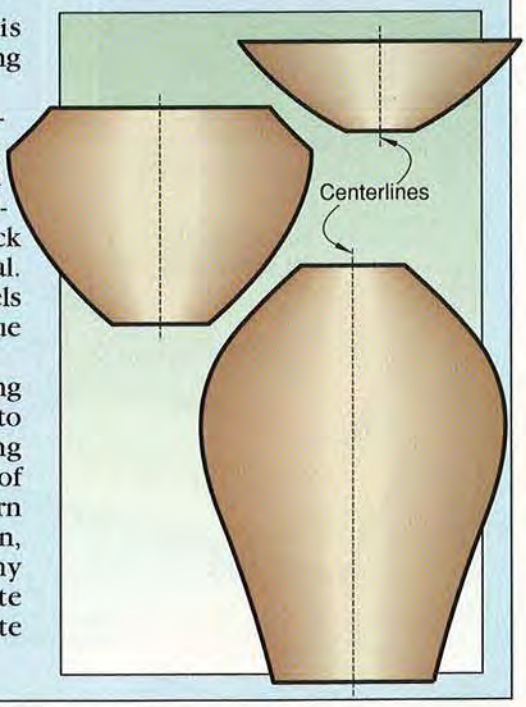


HALF-PATTERN ANATOMY

zontal (you can stretch this slightly, but you'll end up doing additional sanding).

3) The total height of the vessel should be divisible by the thickness of stock you intend to use. In other words, in a 9"-high vessel made from ¾"-thick rings, you'll have 12 rings total. Thicker stock will yield vessels with fewer rings and less glue lines.

Now, fold the paper containing your design in half vertically to yield a half-pattern. Cut along the pattern line with a pair of scissors. Transfer the half-pattern to another sheet of paper. Then, refer to the Pattern Anatomy drawing *above* and complete steps 2, 3, and 4 to complete your pattern.



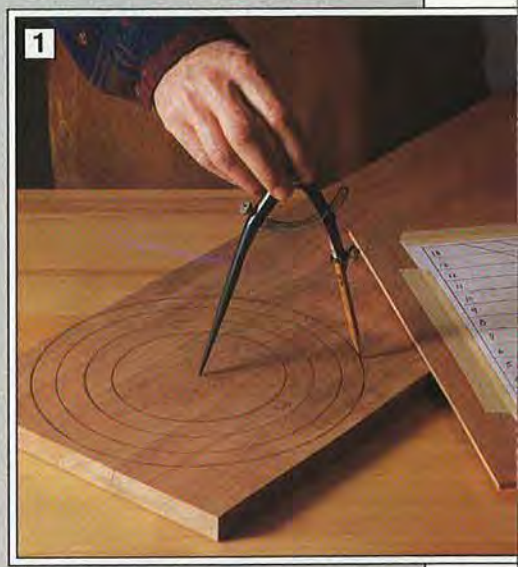
Now, lay out the rings on your stock

At this point, keep in mind that you will construct most vessels, other than open bowls, from two halves. (This enables you to later smooth the inside surfaces of both halves and then join them before smoothing the outside.) These halves consist of rings stacked one atop another. But because the procedure for laying out the rings differs slightly for the top and bottom halves, lay out and cut all of the rings for one half before starting on the other.

As noted on the Pattern Anatomy drawing, you need to lay out the bottom surfaces of top-half rings, and the top surfaces of bottom-half rings. This way, you always lay out the widest diameter of each ring. Here's how to go about it:

Starting anywhere on your pattern, set your compass for the outer radius of a ring and transfer a circle of that radius to your stock. Repeat this procedure for the corresponding inner radius. Be careful to check off the rings on the pattern as you lay them out, and mark the ring numbers on your stock.

As shown in *Photo 1*, you can sometimes save stock by laying out small rings inside larger ones. Just be sure to allow for the beveled cuts coming up.



Continued

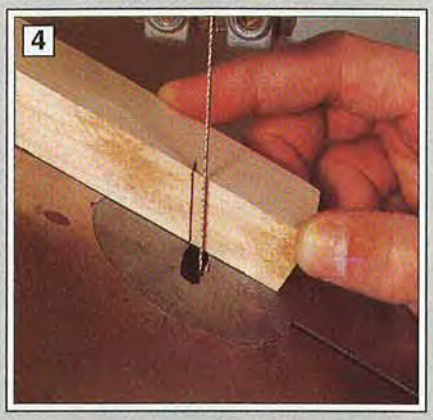
STACKED-RING VESSELS

Accurate cuts will ease your sanding work later

In this section we'll show you how to cut the outside of the ring with a bandsaw, and the inside with a portable jigsaw. You could use a jigsaw for both cuts, but your results won't be as smooth and accurate, and you'll have to do more sanding on the vessel's outer surface. (A scrollsaw will also work for outside cuts.)

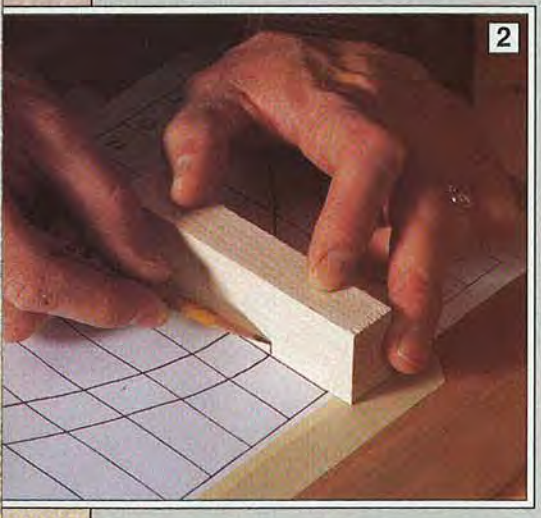
To transfer the necessary cutting bevel from the pattern to your bandsaw table, first lay the edge of a 3-4" long scrap of wood, the same thickness as your stock, onto a ring layer as we're doing in *Photo 2*. Mark the points where the outer profile of the ring meets both sides of the scrap piece. Then, use a straightedge to draw a line on the edge of the scrap that connects these two points as shown in *Photo 3*.

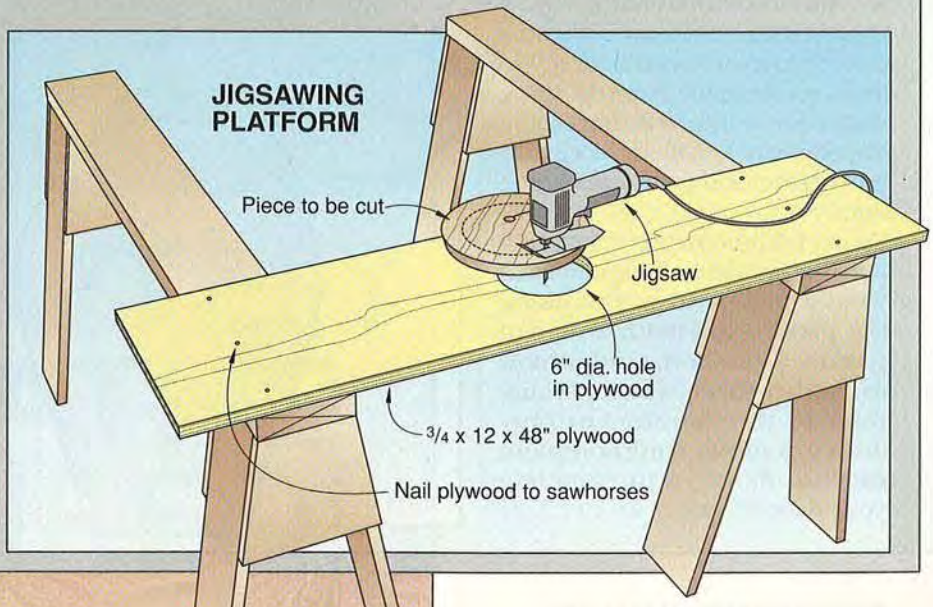
Adjust your bandsaw table to this angle as depicted in *Photo 4*. Keeping the blade on the "uphill" side of the workpiece, cut the outside profile as shown in *Photo 5*.



To cut the inside profile, adjust the base of your jigsaw so the saw blade parallels the outside-profile cut as shown in *Photo 6*. Drill a starting hole for the saw blade at the necessary angle on the inside of the ring. To make the cutting as smooth as possible, use a jigsawing platform like the one shown *below*. (The base, which you'll cut later, is not truly a "ring," so it does not require an inside jigsaw cut.)

After cutting each ring and the base, mark a line centered on the end grain on the outside of each piece. These marks will help you line up the layers in the same grain orientation in the next step.





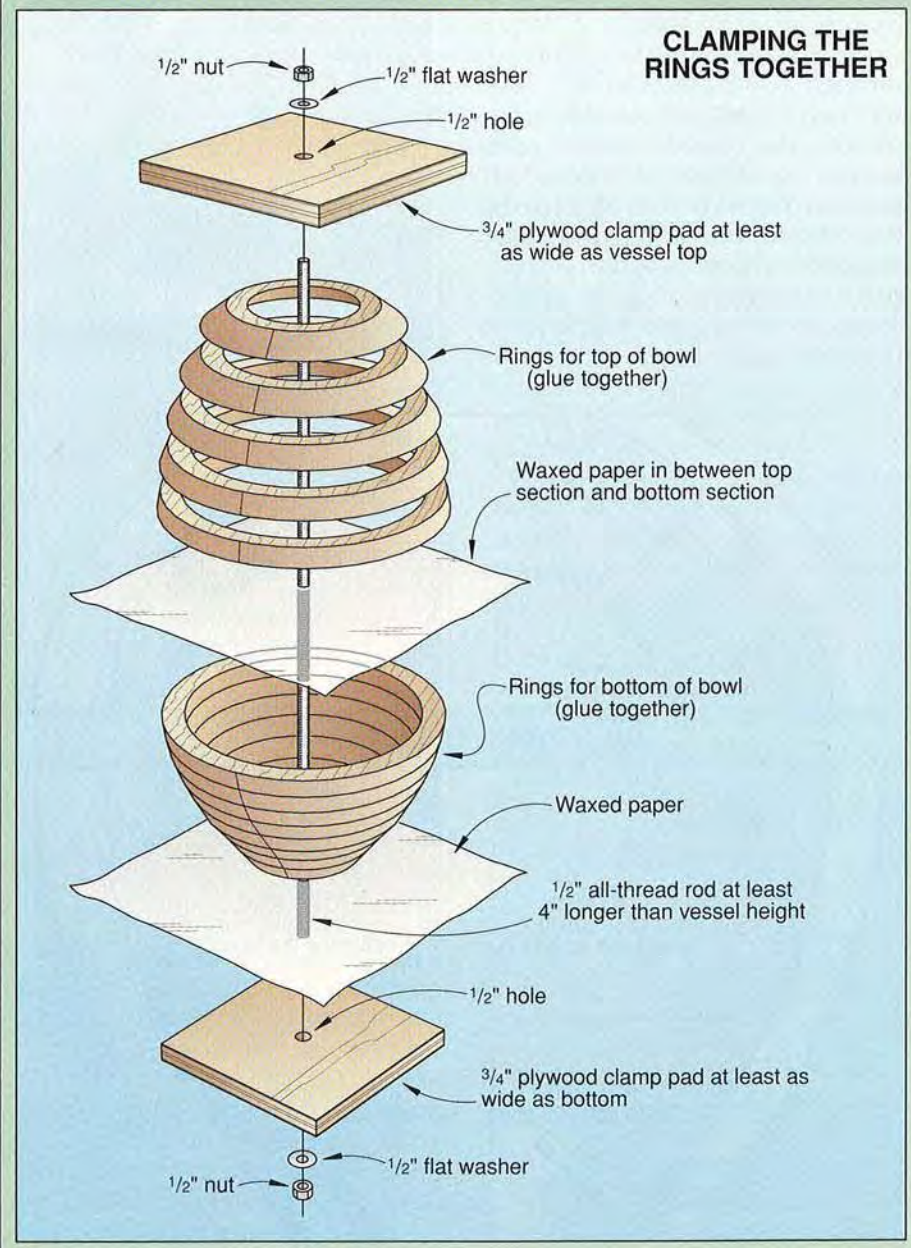
Let's glue, stack, and clamp the rings

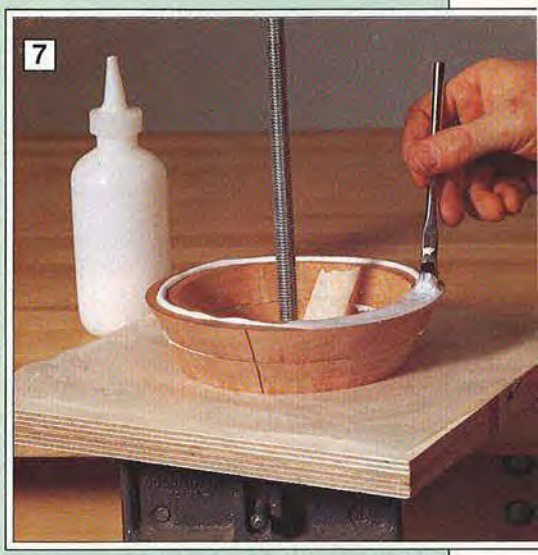
To clamp the rings together you need a length of ½" all-thread rod that's at least 4" longer than your vessel's height, two ½" flat washers, two ½" nuts, and two pieces of ¾" plywood at least as wide as the top and bottom of your vessel. These components go together as shown *below*.

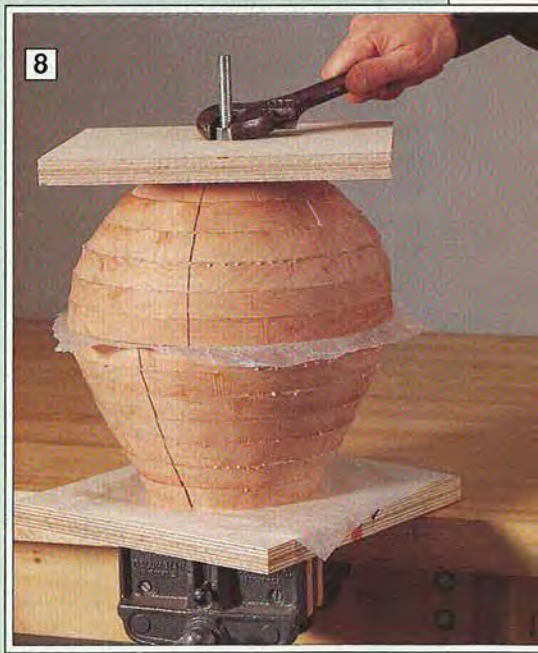
To use this clamping setup, first thread the bottom nut completely onto the all-thread rod and secure the nut in a bench vise with the all-thread rod pointing up. Stack the bottom washer, clamp pad, and waxed paper onto the rod.

Now, set the vessel base (layer 1) aside, and center the bottom ring (ring 2) on the waxed paper. Apply a thin, uniform coat of white woodworker's glue to the top surface of this ring and to the bottom surface of the adjoining ring (no. 3). Stack the pieces and proceed with the rest of the rings as shown in *Photo 7*. Line up the end-grain marks as you stack, and apply short pieces of masking tape over the inside joint lines to keep the rings centered and aligned. Repeat this procedure for all of the bottom-half rings, but do not apply glue to the top surface of the top layer in this half.

Apply a piece of waxed paper onto the top of the bottom half. Then, glue and stack the top-half rings. Clamp all of the rings by adding the top plywood pad, washer, and nut. Tighten the nut as shown in *Photo 8*, and allow the assembly to dry overnight.


CLAMPING THE RINGS TOGETHER
1/2" nut
1/2" flat washer
1/2" hole
3/4" plywood clamp pad at least as wide as vessel top
Rings for top of bowl (glue together)
Waxed paper in between top section and bottom section
Rings for bottom of bowl (glue together)
Waxed paper
1/2" all-thread rod at least 4" longer than vessel height
1/2" hole
3/4" plywood clamp pad at least as wide as bottom
1/2" flat washer
1/2" nut

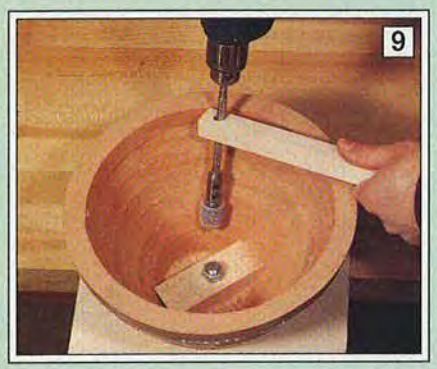




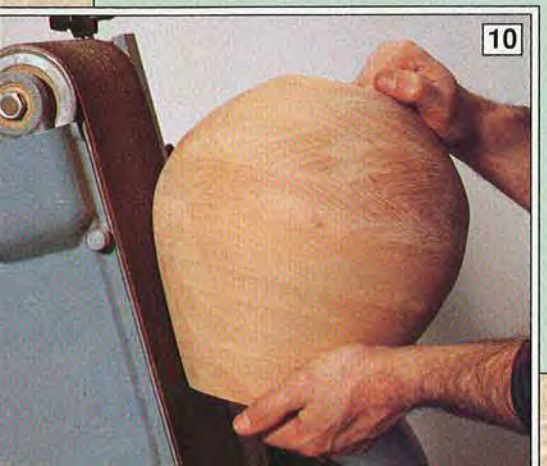
STACKED-RING VESSELS

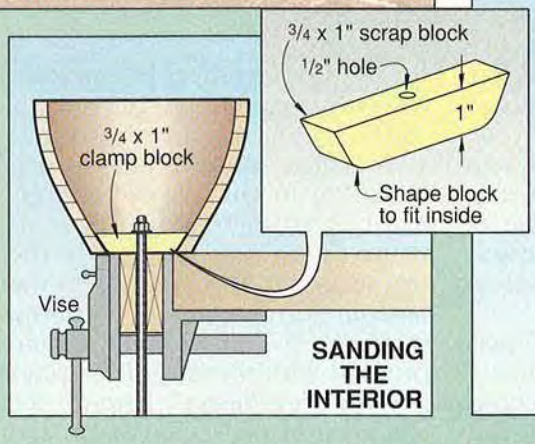
Use these tricks to smooth the vessel

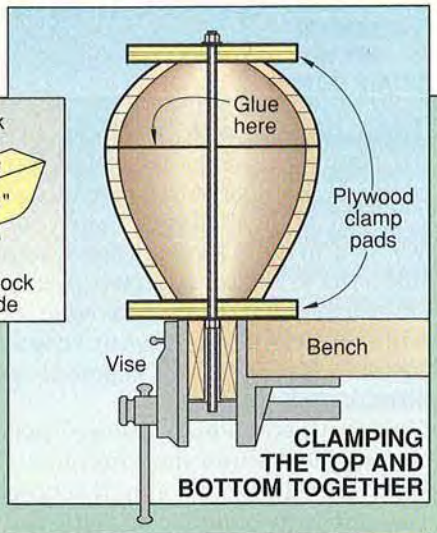
Smooth the inside of each vessel half by first securing it in your vise as shown *near right*. Then, use an electric drill and the smoothing accessories shown in the Smoothing the Interior drawing *below* to complete the job. (The Kutzall carbide cutters are made by L.R. Oliver Company. Call 810/725-1230. We obtained the flexible "Power Lock" sanding discs from The Woodworkers' Store. Call 800/279-4441.) Deep vessels may require that you use a drill-bit extension as shown in *Photo 9*. At these times, use a wooden block with a hole drilled in it to steady the extension.



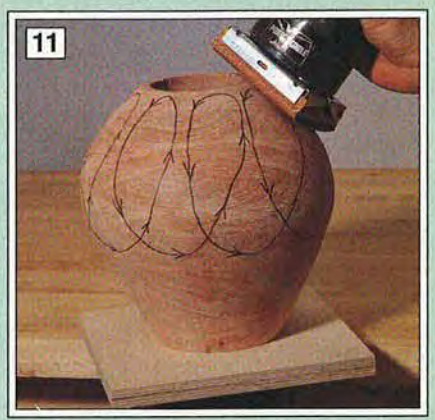
With the inside surfaces smoothed, glue the two halves together as shown *top, far right*. After the glue dries, use a stationary belt sander to rough-sand the outside of the vessel as shown in *Photo 10*. Remember to keep the vessel moving at all times to avoid flat spots. Check the shape of the vessel frequently by holding it at arm's length.

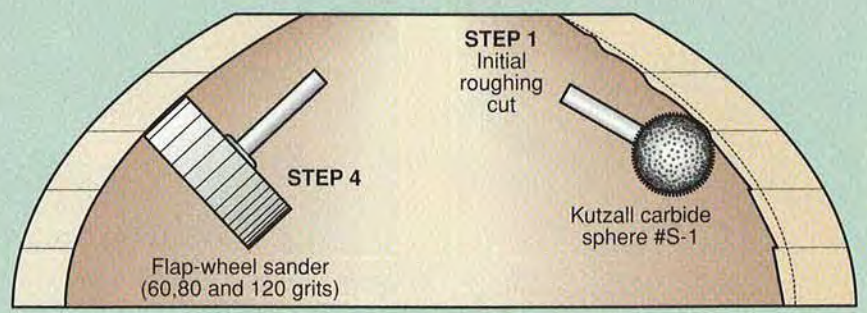




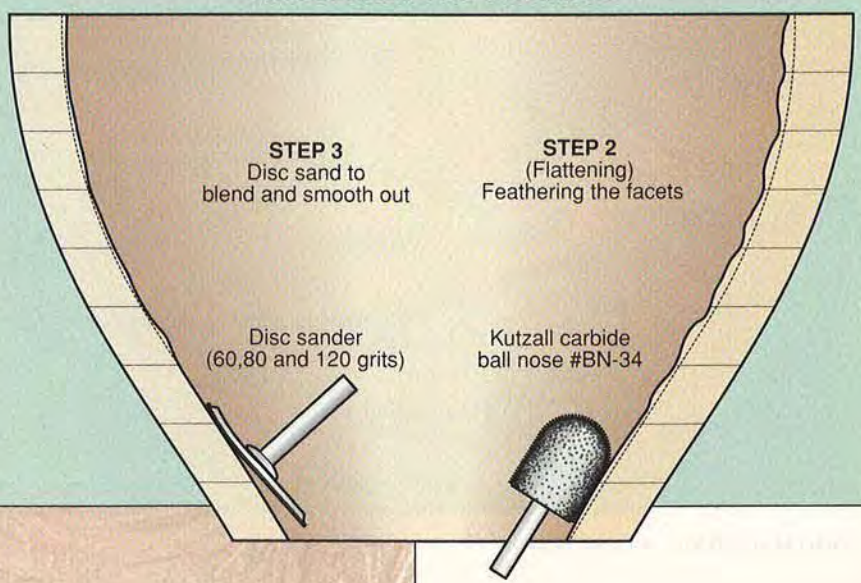


To finish-sand the outside surface, secure the vessel to your bench vise as you did when smoothing the interior. Working through a succession of 80-, 100-, 150- and 220-grit sandpapers, smooth the outside with a palm sander as shown in *Photo 11*. Smooth the top half by moving the sander as shown by the arrows in the photograph. Then, turn the vessel upside down, secure it in the vise, and smooth the other half.



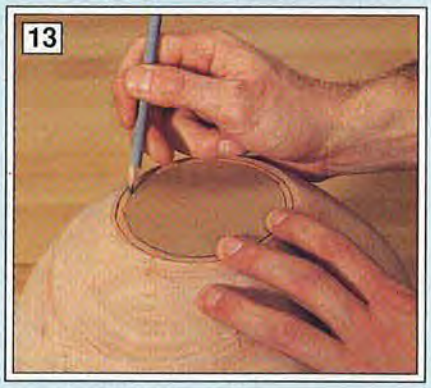


SMOOTHING THE INTERIOR

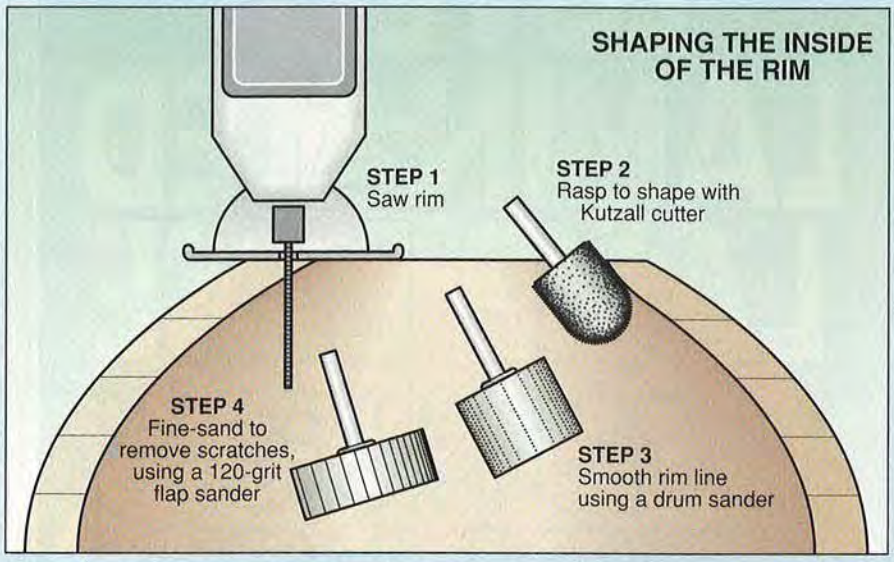


From top to bottom: Shape the rim and add the base

At this point, the top rim of your vessel probably appears a little ragged and oblong. No problem. To give your vessel a "just-turned" look you need to shape the rim so it appears perfectly round. To do this, adjust a compass to draw the largest-possible circle that will fit on the vessel's top. Mark this circle (the outside rim line) onto a piece of cardboard. Then, draw another circle (the inside rim line) ⅜" inside the larger circle. Cut the cardboard carefully along the outside circle. Center this circle on your vessel's rim, and trace its outline as shown in *Photo 12*. Then, cut along the inner circle and transfer it to the rim as depicted in *Photo 13*.

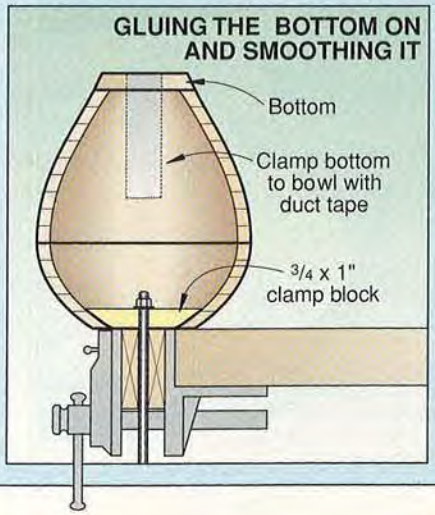


With a portable belt sander, remove the stock outside of the outer circle and blend the rim with the rest of the vessel. Smooth the outside of the rim with a palm sander. Now, using the inner circle as a guide, follow the steps in the Shaping the Inside of the Rim drawing *top* to finish the rim of your vessel.


SHAPING THE INSIDE OF THE RIM
STEP 1
Saw rim
STEP 2
Rasp to shape with Kutzall cutter
STEP 3
Smooth rim line using a drum sander
STEP 4
Fine-sand to remove scratches, using a 120-grit flap sander

Before attaching the bottom, you need to shape its edge so it fits the contour of the vessel as closely as possible. Do this by placing the vessel onto the bottom and tracing the perimeter of the vessel onto the bottom's top surface. Adjust the table of a stationary disc sander according to the bevel on the base and carefully sand up to your traced line as we're doing in *Photo 14*.

Then, turn the vessel upside down as shown in the drawing *below*, and apply a thin coat of woodworker's glue to both mating surfaces. Clamp the base on by tightly stretching two criss-crossing pieces of duct tape across the bottom. After the glue dries, smooth and blend the edges of the bottom with a palm sander.



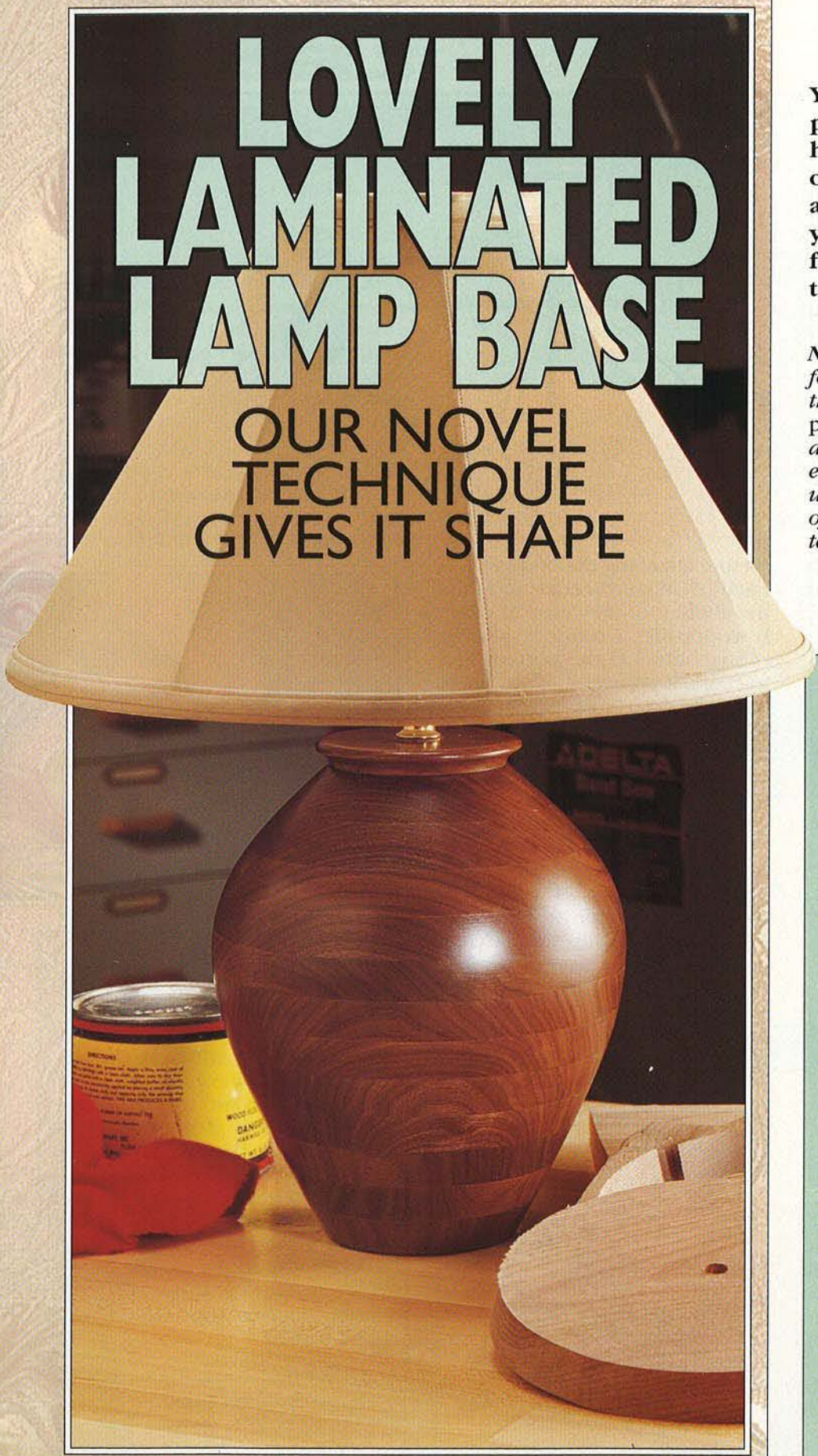
The final touches

As you know by now, smoothing the interior of the vessel is considerably more work than smoothing the outside. So, with vessels having narrow openings (such as those shown in the opening photo), you may elect to not completely smooth the inside. We don't blame you! To make such a rough interior less visible to the eye, apply flat-black paint to the inside of the vessel after applying a clear finish to the outside. Now, you're ready to show off your masterpiece to your woodworking friends.

Written by Bill Krier with Jim Boelling
Illustrations: Kim Downing
Photographs: John Hetherington

LOVELY LAMINATED LAMP BASE

OUR NOVEL TECHNIQUE GIVES IT SHAPE



You don't need a lathe to produce this handsome hardwood lamp base. Using our bandsawing, laminating, and sanding techniques, you're only one board away from this sure-to-be noticed tabletop project.

Note: *To build this lamp base, we followed the process described in the technique article starting on* page 38. *However, to save time and unnecessary labor and to ensure a heavy, stable end product, we didn't remove the inside of each disc as was done in the technique article.*

Print this article

Mark and cut the discs from solid stock

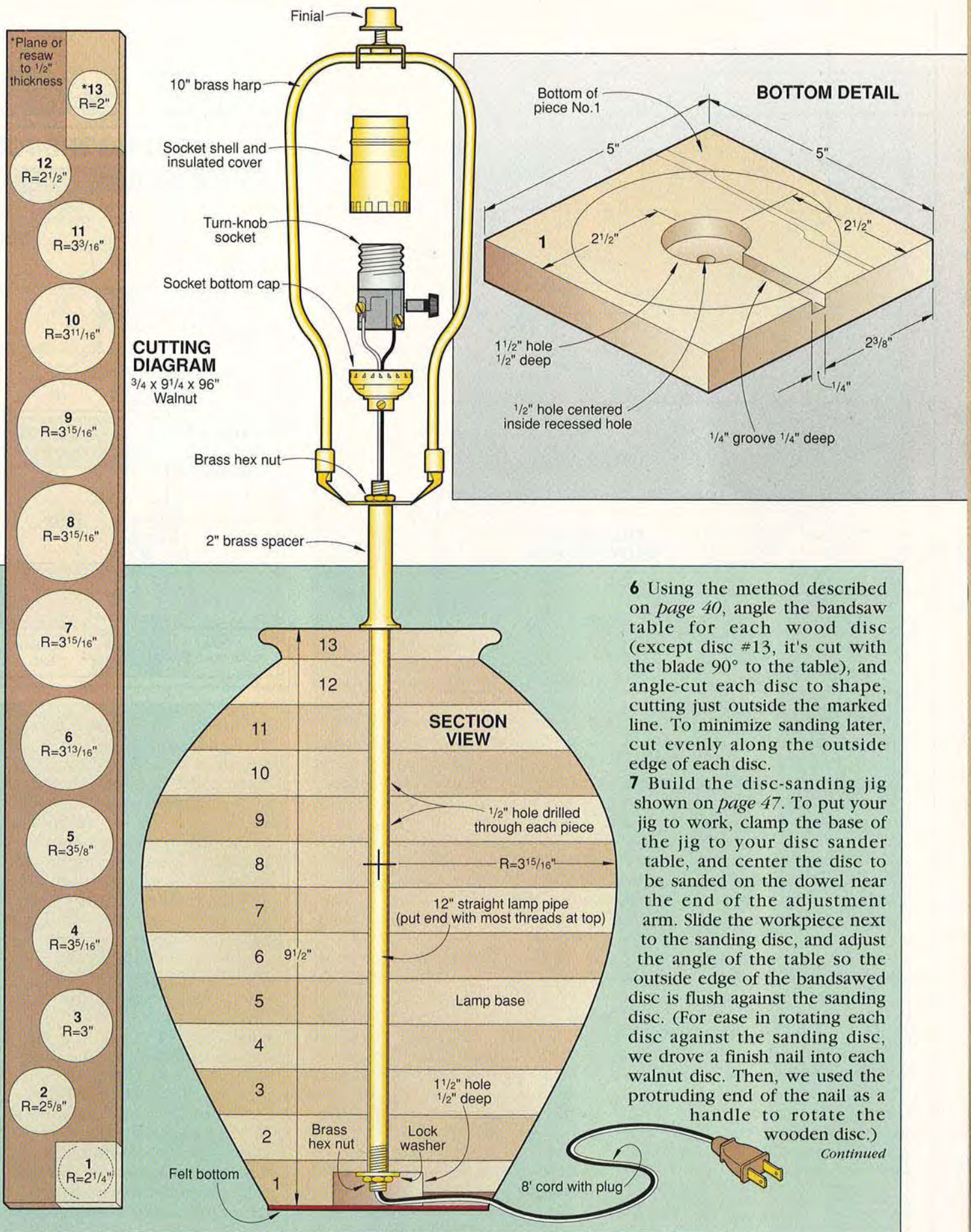
1 Using a compass and radii on the Cutting Diagram, mark 13 circles on solid stock (we used walnut). Note that disc 13 is ½" thick and all the rest are ¾" thick. For tight glue joints later, select uncupped, warp-free stock. (Note that you're marking the large diameter of each disc.) For ease in assembling the discs in the proper sequence later, number each disc's top face.

2 Cut between the marked discs on the board so each disc is on a separate piece of wood (this makes them easier to cut on the bandsaw in the Step 6).

3 Drill a ½" lamp-pipe access hole through the center (where indented with the compass in Step 1) of each wood disc.

4 Switch to a 1½" Forstner bit and bore a ½"-deep recess on the bottom side of disc #1.

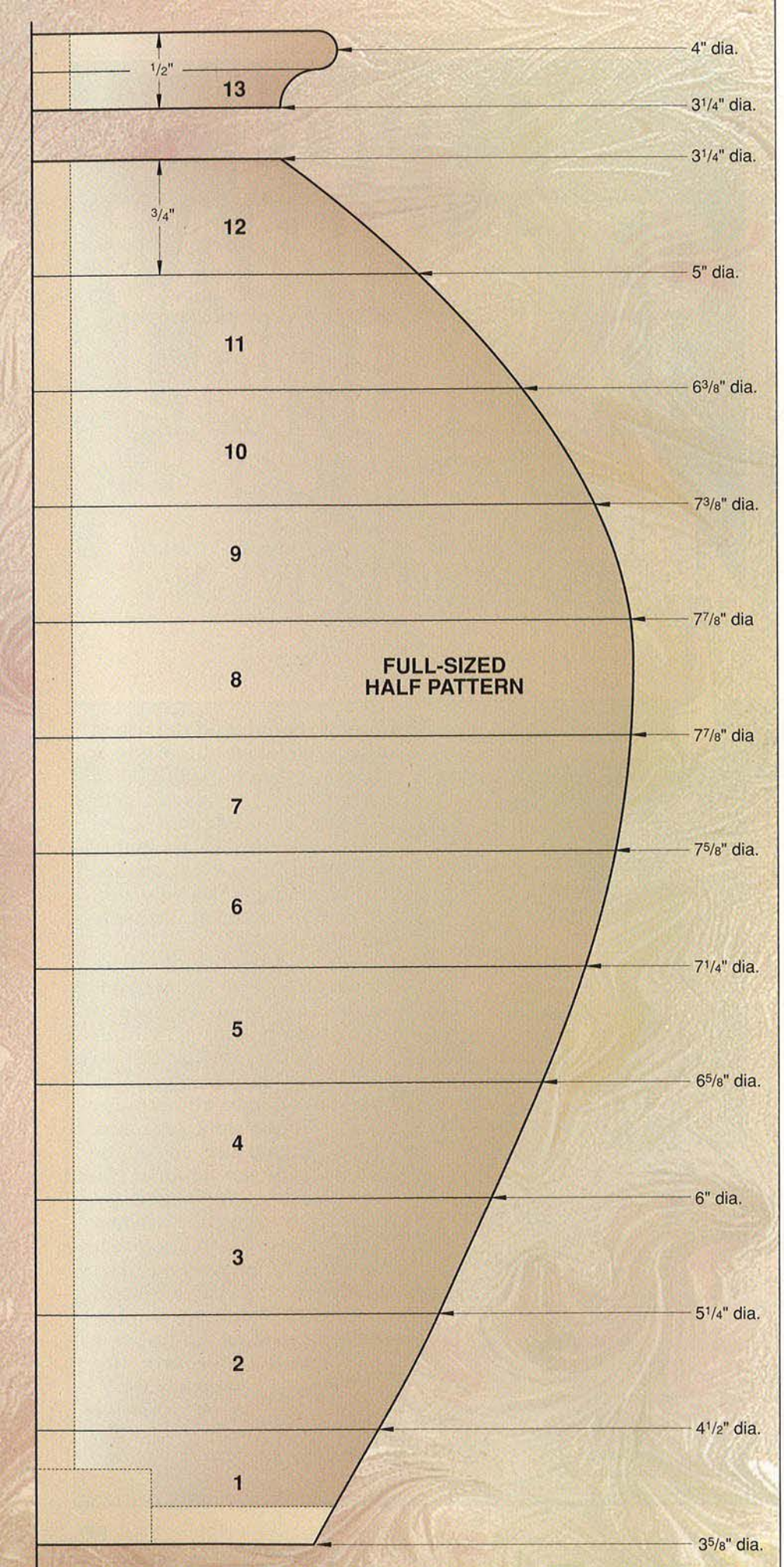
5 With double-faced tape, secure the bottom disc (#1) to your workbench top, and rout a ¼" groove ¼" deep where shown on the Bottom View detail for housing the electrical cord later.



6 Using the method described on *page 40*, angle the bandsaw table for each wood disc (except disc #13, it's cut with the blade 90° to the table), and angle-cut each disc to shape, cutting just outside the marked line. To minimize sanding later, cut evenly along the outside edge of each disc.

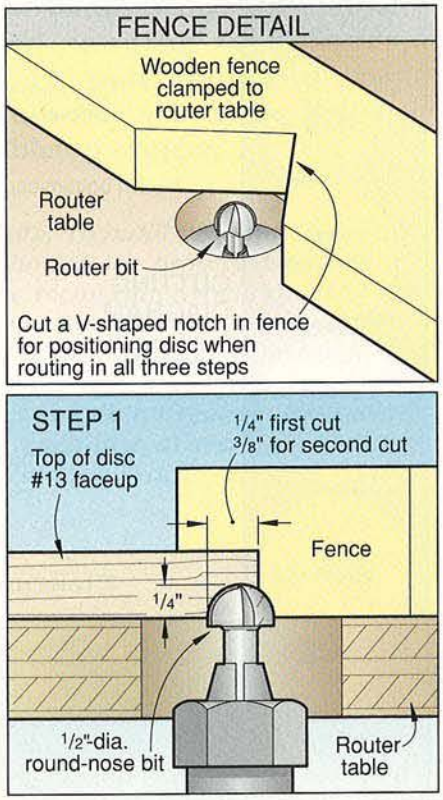
7 Build the disc-sanding jig shown on *page 47*. To put your jig to work, clamp the base of the jig to your disc sander table, and center the disc to be sanded on the dowel near the end of the adjustment arm. Slide the workpiece next to the sanding disc, and adjust the angle of the table so the outside edge of the bandsawed disc is flush against the sanding disc. (For ease in rotating each disc against the sanding disc, we drove a finish nail into each walnut disc. Then, we used the protruding end of the nail as a handle to rotate the wooden disc.)

Continued



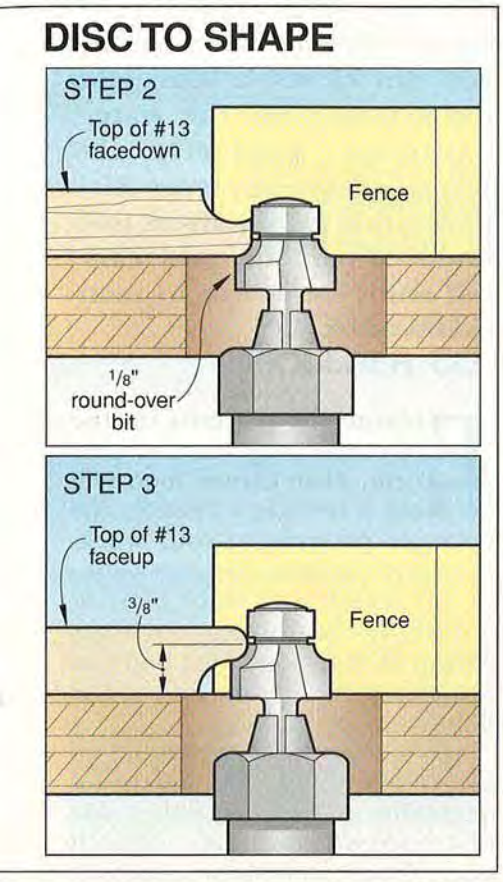
LAMP BASE

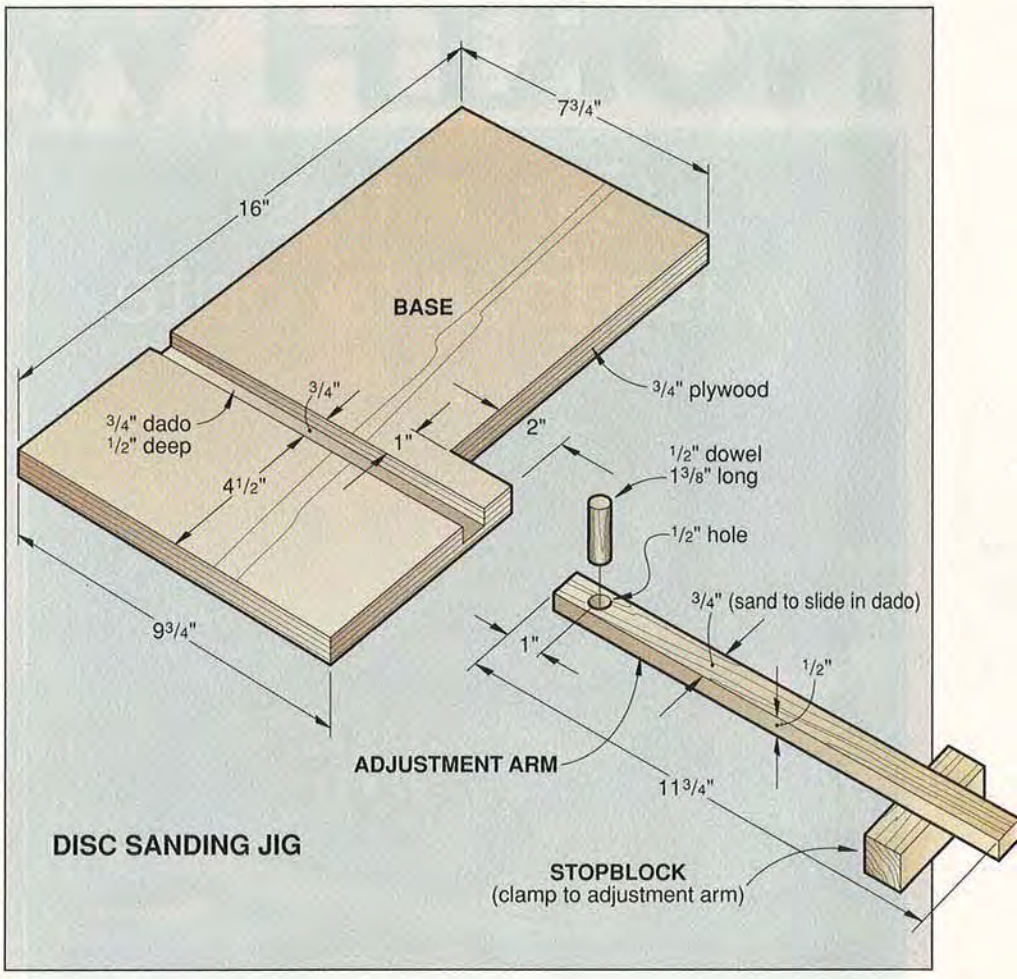
ROUTING THE TOP

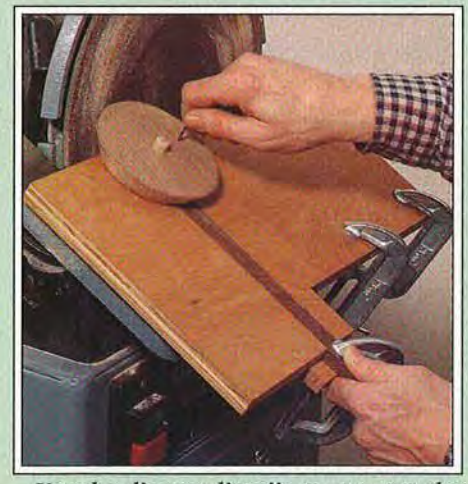


8 Start the sander, and slowly slide the adjustment arm with attached wood disc into the sanding disc until the disc sands to the marked line. Turn the sander off, clamp the stopblock to the adjustment arm, turn the sander on again, slide the adjustment arm until the stopblock makes contact with the base, and slowly rotate the workpiece against the sanding disc as shown in the photo *at right*. After sanding each disc, position it against its mating disc with the grain of both aligned, to check for flushness of the mating sanded edges. Resand if necessary for flush edges. It's easier and much faster to sand the individual discs now for a flush fit, than to try to palm-sand the glued-together lamp base later.

9 Sand the edge of the top disc with the stationary disc sander table 90° to the sanding disc.







Use the disc-sanding jig to support the wood disc while sanding to the marked circumference line.

Next, using the three-step process on the drawing titled Routing the Top Disc to Shape, rout the top and bottom edge of the top disc (#13). We used a flat board with a V-shaped notch bandsawed into it to safely rout the pieces.

10 Position disc #13 on top of disc #12, and check that the mating edges are flush. If not, resand disc #12 or rout a bit deeper with the round-nose bit along the bottom edge of disc #13.

11 Mark a line centered on the end grain on the outside of each disc. The marks will help you line up the discs when gluing the pieces together.

Laminating the discs comes next

1 Spread an even coat of white glue (white glue provides more workable open time than yellow glue) on the mating surfaces. Then, working from the bottom up, glue and clamp the hardwood discs together using a ½" threaded rod 18" long (see the photo on *page 41* for reference). Work carefully to keep the edges of the discs flush and the end grain marks aligned when gluing. Again, take your time—the more flush the edges, the less time you'll need to spend sanding later. Use a damp cloth to wipe off the glue squeeze-out. It's easier to wipe off the wet glue now than to have to sand it off later.

2 Using a palm sander and 80-, 100-, 150-, and finally 220-grit sandpaper, sand the lamp base smooth. Apply a clear finish (we used Deft aerosol lacquer).

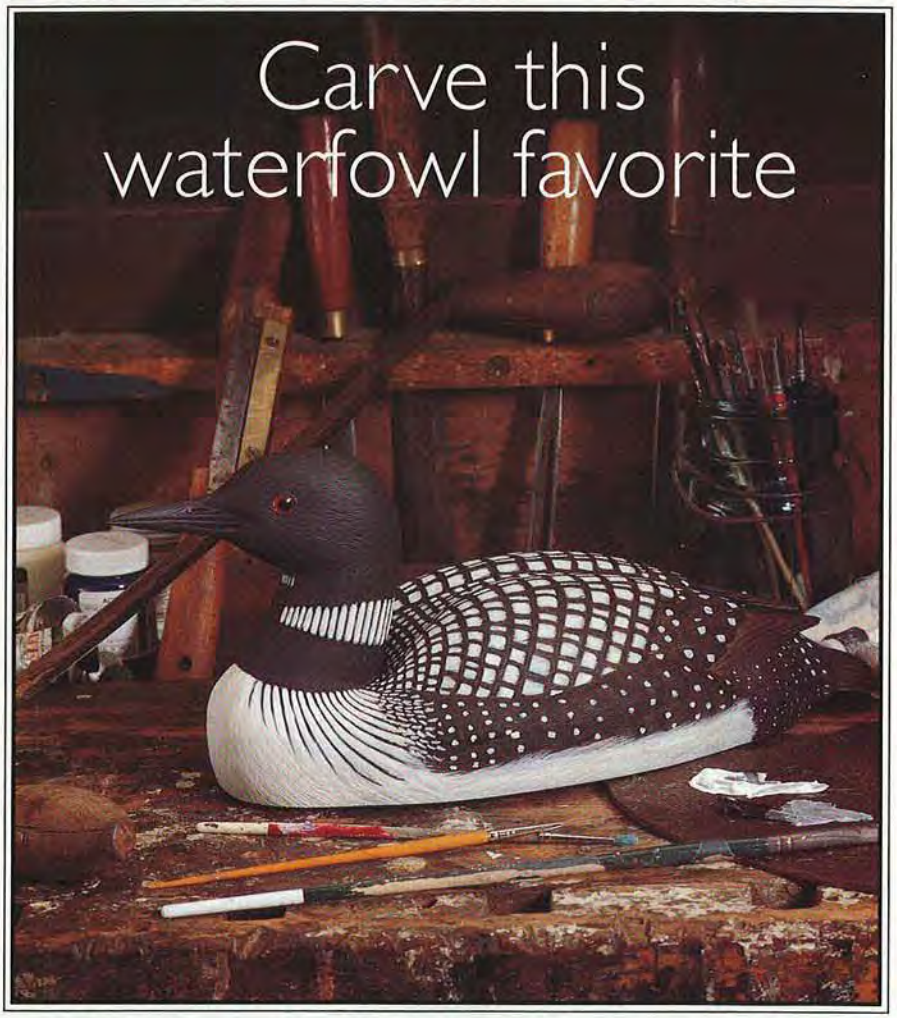
3 Add the hardware, felt, and wire the lamp as shown in the Section View drawing.

BUYING GUIDE

Lamp kit. Parts needed to wire the lamp, plus felt. Kit no. 3406, $9.95 plus $3.50 shipping. Meisel Hardware Specialties, P.O. Box 70W, Mound, MN 55364-0070. Or call 800/441-9870 to order.

Project Design: James R. Downing
Illustrations: Kim Downing
Photographs: John Hetherington

NORTH WOODS



Here's classic waterfowl art you can carve—a loon gliding serenely on the water. Captured perfectly by Wisconsin woodcarver Rick Beyer, this loon delivers one-hundred percent pure carving enjoyment, not to mention beauty.

Enlarge the patterns on the *opposite page* at 200 percent. (The carved loon will be about ⅔ life size.) Transfer the enlarged patterns to your stock. Bandsaw the side and top views of the head and body blanks. Follow the outer pattern lines except at the back of the body on the side view; there, follow the dotted cutting line.

Draw a lengthwise centerline on top of the body. Parallel to the centerline and 1½" on either side of it, add two more lines. On each edge of the blank, draw a line parallel to the bottom and 1⅜" above it. Then, sketch in the neck location where shown by the Body Top View pattern.

Continued on page 50

We used these tools and supplies

Stock: Basswood or other carving wood, 2×5½×4" for the head, 3½×6×13" for the body (see Buying Guide *below* for bandsawed blanks).

Power carving equipment: Flexible-shaft rotary carving machine or rotary hand tool

Bits

Carbide-tooth tapered burr, ½ or ¾" (Kutzall silver T-12 or T-34)

Fluted carbide burr, ¼" inverted cone, ¼" or larger

Ruby carver, flame point, small and large

Knife: Bench knife or X-Acto knife

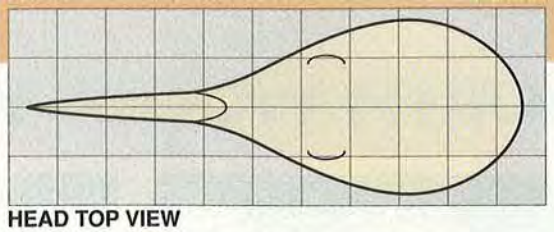
Print this article

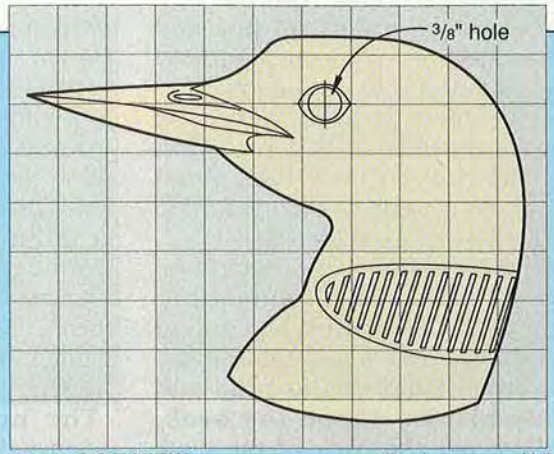
Buying Guide

Loon kit. Bandsawed head and body blanks with detailed painting instructions, $29.95 ppd. in U.S. Wisconsin residents add $1.50 sales tax. Order from R.J. Beyer Galleries, 1115 N. Main St., Racine, WI 53402, 414/633-7172.

Painting guide. Detailed painting instructions alone, $6.95 ppd. in U.S. Wisconsin residents add 35¢ tax. From R.J. Beyer Galleries, address above.

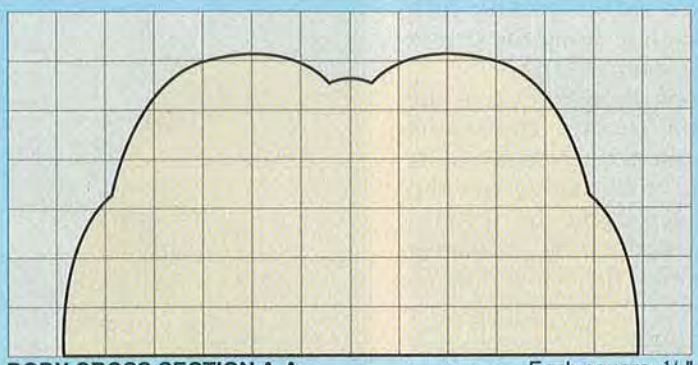
NESTER


HEAD TOP VIEW

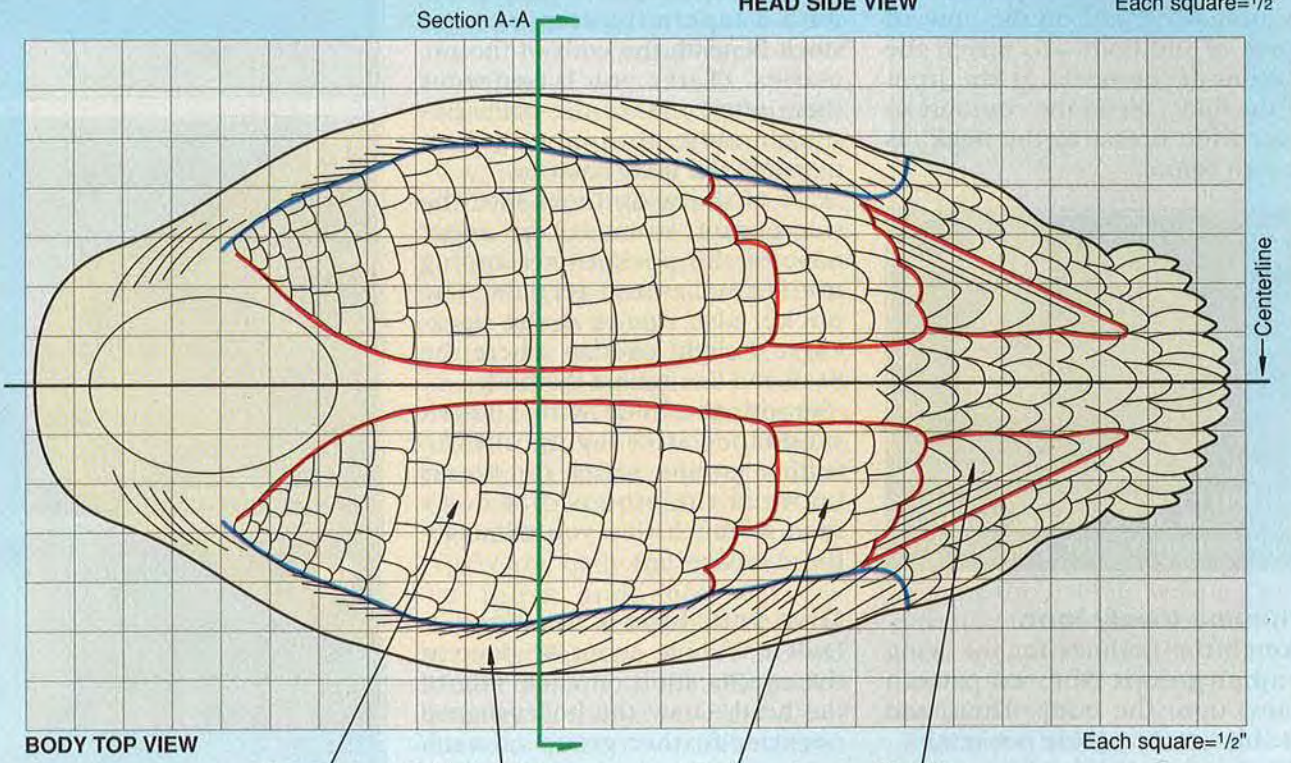


HEAD SIDE VIEW

Each square=1/2"


BODY CROSS SECTION A-A

Each square=1/2"



BODY TOP VIEW

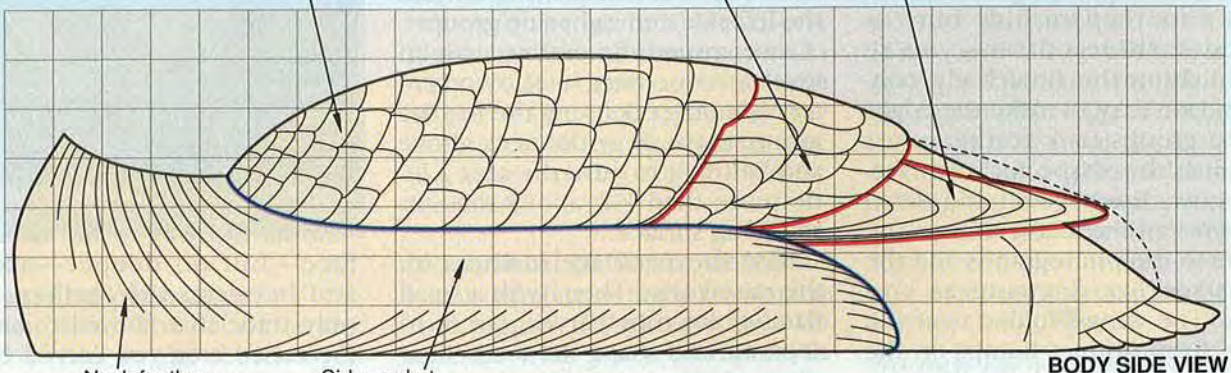
Each square=1/2"

Scapulars

Side pocket

Tertials

Primaries



BODY SIDE VIEW

HALF-SIZED PATTERNS

Bevel the top of the body blank by cutting away the wedge between the outer top line and the edge line. Tilt your bandsaw table about 45° to do the job.

In the same fashion, bevel the square corners of the head (but not the beak). Cut to lines about ½" on either side of the centerline and about ½" from the top.

With a rasp or a rotary power-carver fitted with a toothed carbide cutter (Kutzall type), round the sharp corners and smooth the sawed surfaces of the head and body blanks. Shape the beak. Hollow out the back of the neck location—the part on the upward curve of the body—to match the bottom of the neck. At the front of the body, blend the contours to match the breast to the neck, as shown *below*.

Guidelines show feather groups for carving. When fitting the head, slope the flat top of the head to match the angle at the rear of the body.

Shape a lovely loon

Sketch the outlines for the wing feather groups (the red pattern lines) onto the body. Then, add the blue-outlined side pockets.

Now, carve the feather groups. Take care as you shape the areas with a toothed carbide burr or fluted carbide cutter—you're establishing the final body contours. Don't try to make the edges of the groups look feathery, just establish the shape for each feature now. Later, you'll add detail to represent the feathers.

Refer to the photographs and the cross-section drawing as you work. The wings, folded over the body, form distinct humps on the bird's back. The body itself curves smoothly from behind the neck up to the high point on the back (which is at the wide point on the body), then down to the tail. Establish that line along the center of the loon's back.

As you carve, remember that the wing groups overlap. The scapulars, the feathers nearest the body at the front of the wing, overlap the next layer back, the tertials. The primaries, the long feathers at the outer end of the wing, emerge from beneath the tertials at the back of the body.

The primaries don't lie flat against the body at the back. So, with a tapered cutter, remove stock beneath the ends of the primaries. (Later you'll undercut them more.) Make the primaries straight rather than curving them to match the body contour.

Part of the wing tucks into the side pocket, so model the upper edge of the pocket overlapping the scapulars and tertials. The pocket also opens at the back. Carve a slight overlap where the back end lies against the body.

Smooth the body with 100-grit sandpaper after laying out the feather groups. Soften the breaks between the groups, but don't sand so much that you eliminate those separations.

Give your loon a necklace

Drill a ⅜" hole about ⅜" deep at the eye location on each side of the head. Draw the bullet-shaped necklace-feather group on each side of the neck. At the back of the neck, leave about ⅜" between the left-side and right-side groups.

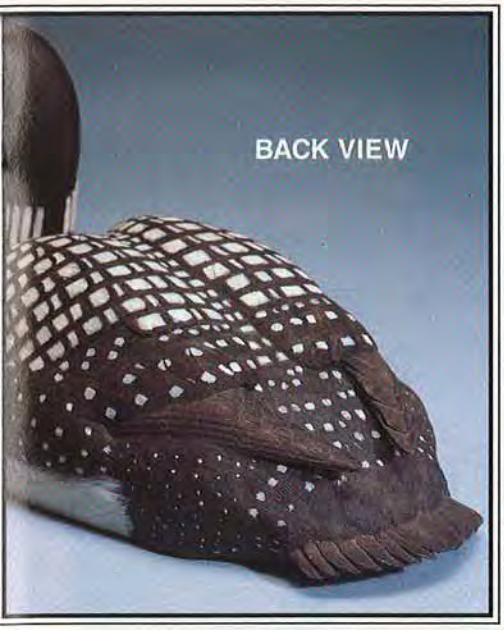
Carve around the outline with an inverted-cone burr, as shown *center right*. After defining the feather group, carve away the neck above and below it to raise the area a little more than 1/32" above the surrounding surface.

Draw the necklace feathers on the raised area. Then, with a small flame-point ruby carver, cut in to separate and shape the feathers as shown *bottom right*.

Raise the necklace-feather area with an inverted cone burr.

Separate the necklace feathers first, then shape the ends. The finished necklace will stand above neck surface 1/32" or less.

Cut all the way to the neck surface—but no deeper—around and between the feathers. The only trace that should remain of the raised area you carved earlier is the necklace of feathers.



You don't need to draw every feather, just sketch in the general lay of the plumage.

Rough in the tail feathers about ⅛" thick. Finished feathers display a convex upper surface, a flat or slightly concave bottom.

Put on the plumage

Starting from the front of the body, pencil in the feathers, as shown *center above*. Refer to the photographs and patterns. (You may want to gather some additional book or magazine photos of loons, too.)

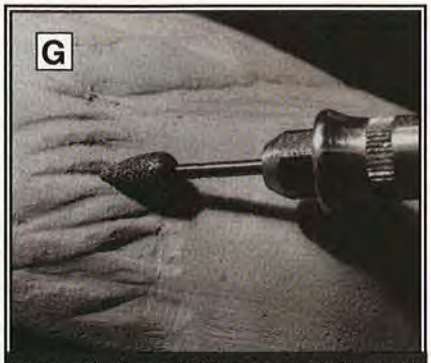
Sketch in the neck feathers where shown, curving them downward and back on each side of the body. Breast feathers flow down the front. You can resolve a lot of feathering questions by imagining the loon facing directly into a strong wind.

With the inverted-cone cutter, shape the tail feathers as shown *below left*. Note that the feathers slant from the left edge down to the right edge on the left side of the tail, the opposite way on the right side.

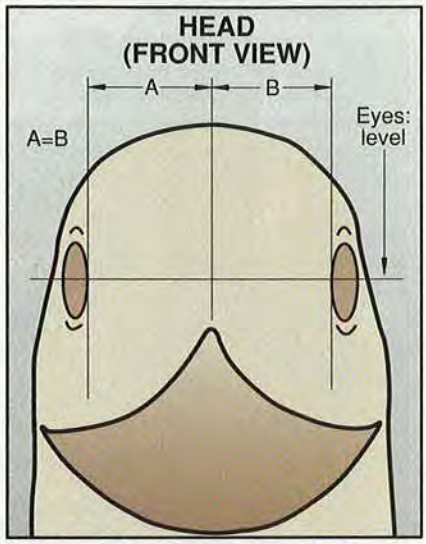
Carve the body feathers with fluted burrs and ruby carvers. Separate the feathers within the wing groups as shown *above*. Model the tips of the side-pocket feathers as shown *top right*. Don't carve too deeply—you're representing feathers, not shingles.

Refer to the patterns and photos to carve the primary feathers. Then, undercut the primaries with a knife. Undercut to a depth of 1⅜" at the outside, all the way to the tertials on the inside. The thickness at the tip should be about ⅛".

After delineating the feathers, establish the layered look by grinding down the front of each segment slightly with a ruby carver.



Instead of modeling each individual feather on the breast and sidepockets, suggest them by carving soft, flame-like streamers.



Now, tend to some details

Mix a small amount of two-part epoxy putty. Fill the eye hole on one side with putty, then press in a 10 mm red glass eye. Install the other eye, and check them for symmetry as shown *above*.

Sculpt the eyelids with a knife, referring to the photographs. Cut the elongated nostrils into the upper mandible with a knife or small rotary bit.

Attach the head to the body with woodworker's glue and a dowel. After the glue dries, grind a V-groove around the neck-body joint, and fill it with two-part epoxy putty. Sand the joint, then sand the entire loon as necessary.

You can now paint the basic loon in a black-and-white scheme, following the photographs. Or, for a more detailed carving, refer to Rick's comprehensive detailing and painting instructions (see the Buying Guide).

Photographs: John Hetherington; Harvey Nyien
Illustrations: Kim Downing

SUNNY-DAY

Hey parents and grandparents, are you looking for the perfect way to keep your kids off the streets and out of trouble? We've got the perfect solution. Our sandbox/toy storage center will keep your kids, and probably many of your neighbors' kids, happily occupied for many fun-filled hours all in the safety of your backyard. And as you can see by looking at the drawings here, this kid-pleasing project is a breeze to build. We completed ours (not including the painting) in just a day. You can, too!

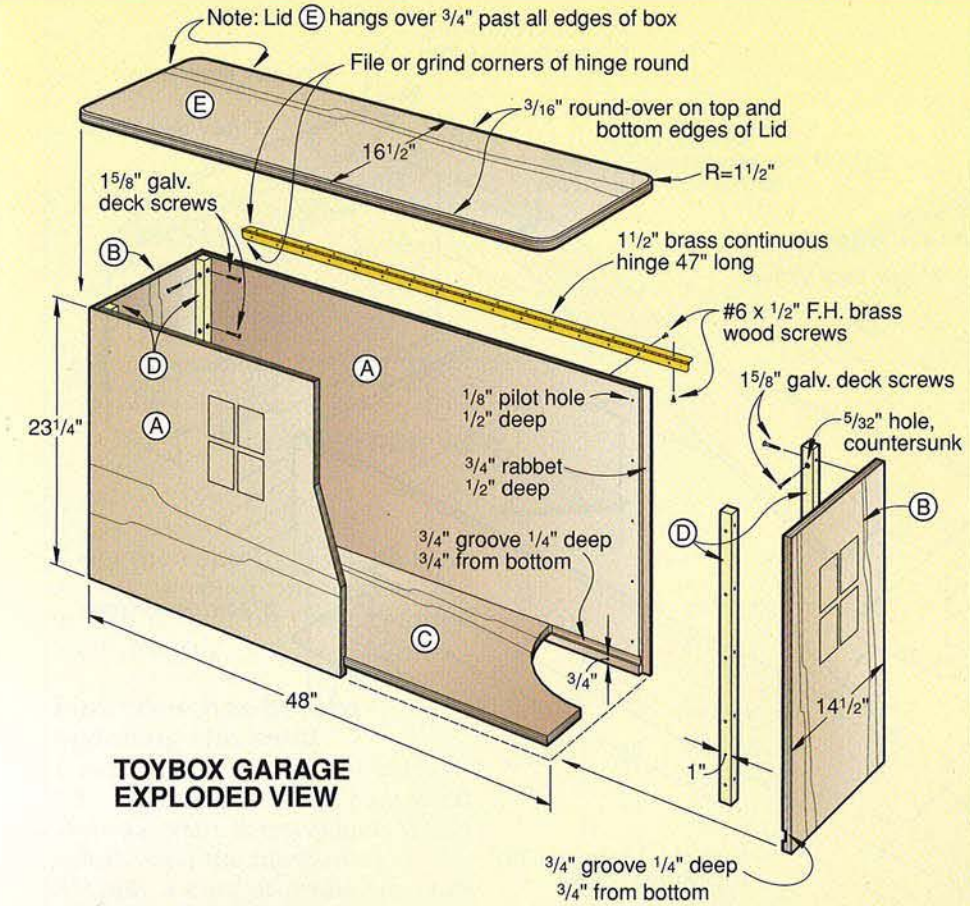
Print this article

Start with the toybox garage

1 From ¾" exterior plywood, cut the front and back (A), ends (B) and bottom (C) to the sizes listed in the Bill of Materials.

2 Cut a ¾" groove ¼" deep ¾" from the bottom edge of the front, back, and end plywood panels (A, B). Cut a ¾" rabbet ½" deep across both ends of the front and back panels. *Continued on page 54*

SANDBOX


Note: Lid (E) hangs over 3/4" past all edges of box
File or grind corners of hinge round
3/16" round-over on top and bottom edges of Lid
16 1/2"
R=1 1/2"
1 5/8" galv. deck screws
1 1/2" brass continuous hinge 47" long
#6 x 1/2" F.H. brass wood screws
1 5/8" galv. deck screws
5/32" hole, countersunk
1/8" pilot hole 1/2" deep
3/4" rabbet 1/2" deep
3/4" groove 1/4" deep 3/4" from bottom
23 1/4"
48"
3/4"
14 1/2"
1"
3/4" groove 1/4" deep 3/4" from bottom

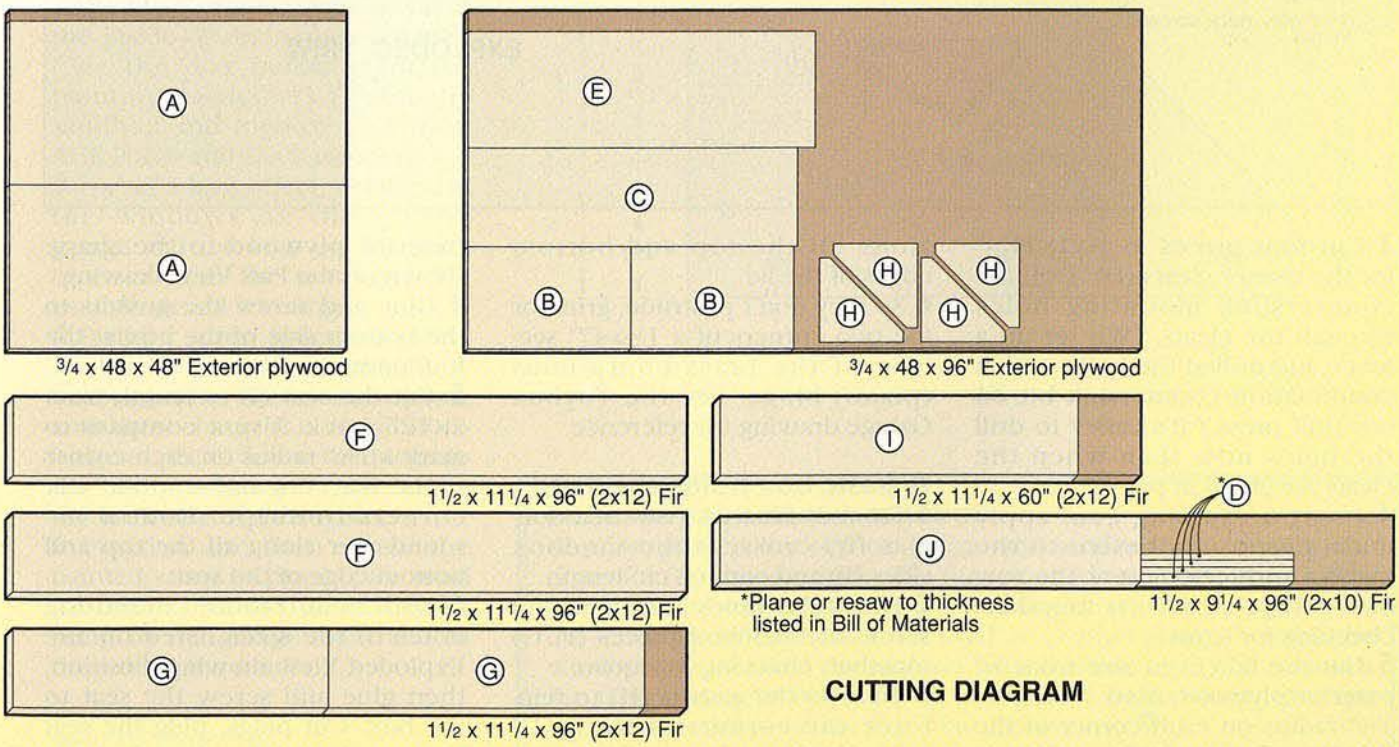
TOYBOX GARAGE EXPLODED VIEW

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
TOYBOX GARAGE					
A front & back	3/4"	23 1/4"	48"	XP	2
B ends	3/4"	14 1/2"	23 1/4"	XP	2
C bottom	3/4"	14"	47"	XP	1
D cleats	3/4"	1"	21 3/4"	C	4
E lid	3/4"	16 1/2"	49 1/2"	XP	1
SANDBOX					
F sides	1 1/2"	11 1/4"	96"	C	2
G ends	1 1/2"	11 1/4"	45"	C	2
H gussets	3/4"	12"	12"	XP	4
I seat	1 1/2"	11 1/4"	51"	C	1
J ramp	1 1/2"	9 1/4"	60"	C	1

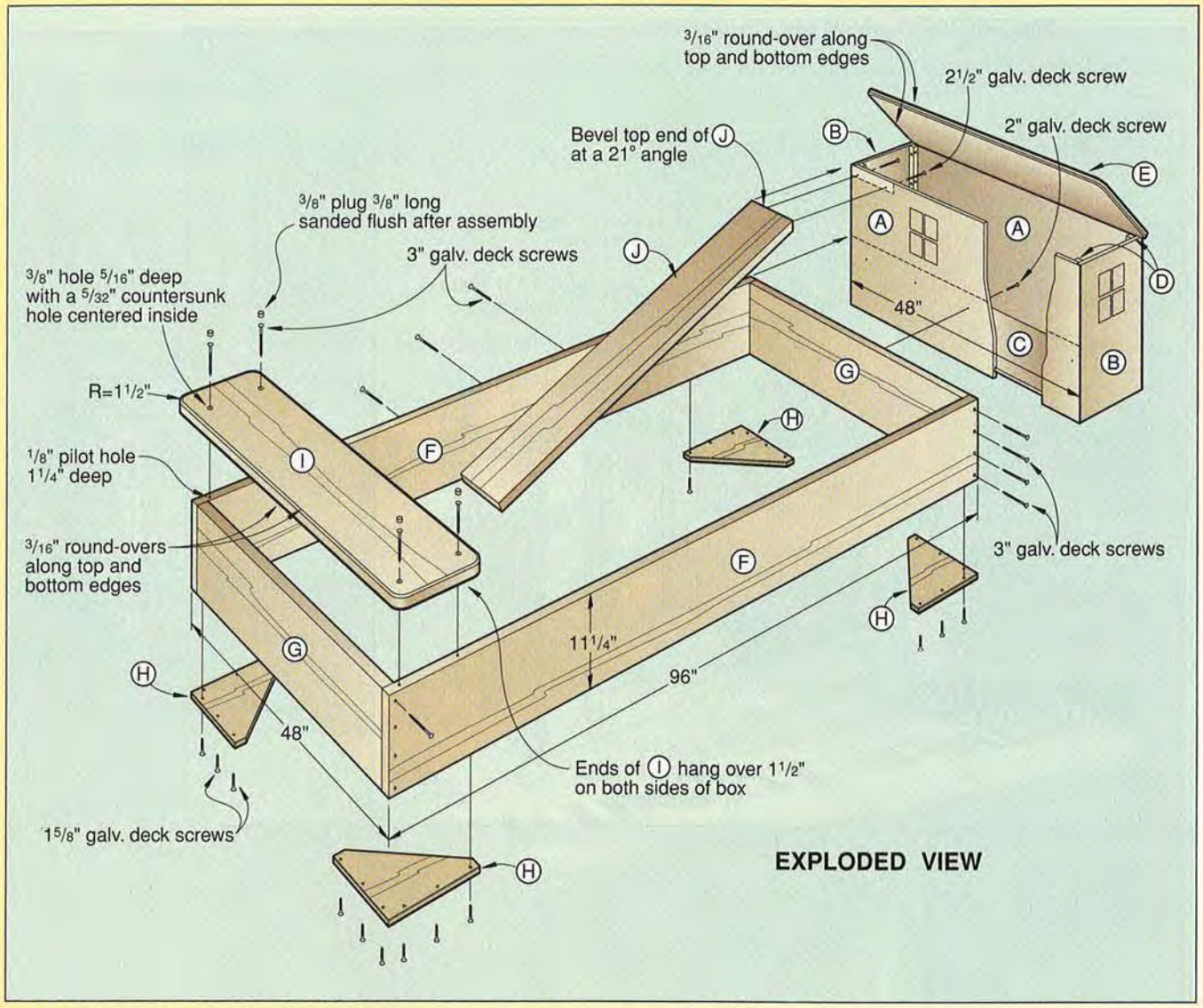
Materials Key: XP–exterior plywood
C–choice (fir, spruce, pine, redwood)

Supplies: 1 5/8", 2", 2 1/2", and 3" galvanized deck screws, multi-purpose adhesive, 1 1/2x47" brass continuous (piano) hinge, #6x1/2" flathead brass wood screws, enamel paints.



CUTTING DIAGRAM

SUNNY-DAY SANDBOX


3/16" round-over along top and bottom edges
2 1/2" galv. deck screw
2" galv. deck screw
Bevel top end of J at a 21° angle
3/8" plug 3/8" long sanded flush after assembly
3" galv. deck screws
3/8" hole 5/16" deep with a 5/32" countersunk hole centered inside
R=1 1/2"
1/8" pilot hole 1 1/4" deep
3/16" round-overs along top and bottom edges
48"
11 1/4"
96"
48"
3" galv. deck screws
Ends of I hang over 1 1/2" on both sides of box
1 5/8" galv. deck screws
EXPLODED VIEW

3 Cut four pieces to ¾×1×21¾" for the corner cleats (D). Drill the countersunk mounting holes through the cleats. (We set up a fence and drilled the holes with a combination countersink bit on our drill press.) It's easier to drill the holes now than when the cleats are glued in place.

4 Using a caulking gun, apply multi-purpose adhesive to the mating surfaces. Screw the toybox garage (A,B,C,D) together, checking for square.

5 Cut the lid (E) to size from ¾" exterior plywood. Mark and cut a 1½" radius on each corner of the lid. Now, rout a 3/16" round-over along all the top and bottom edges of the lid.

6 So they don't protrude, grind or file two corners of a 1½×47" section of the brass continuous (piano) hinge. See the Toybox Garage drawing for reference.

A basic box holds the sand

1 From 2×12 stock (we used douglas fir) crosscut the sandbox sides (F) and ends (G) to length.

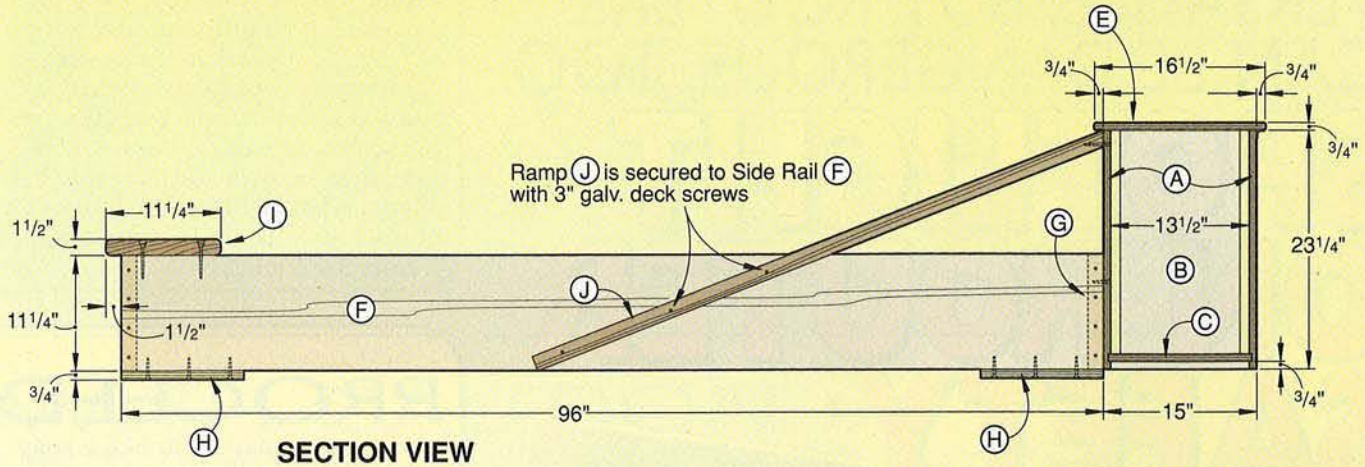
2 Drill pilot holes, and glue and screw the sandbox pieces (F, G) together, checking for square.

3 To form the gussets (H) to reinforce the corners of the 2×12 box, cut four pieces of ¾"-thick exterior plywood to the shape shown on the Part View drawing.

4 Glue and screw the gussets to the bottom side of the box at the four corners.

5 Cut the seat (I) to length from 2×12" stock. Use a compass to mark a 1½" radius on each corner of the seat. Cut and sand the seat corners to shape. Rout a 3/16" round-over along all the top and bottom edge of the seat.

6 Drill counterbored mounting holes to the sizes listed on the Exploded View drawing. Position, then glue and screw the seat to the box. Cut plugs, plug the seat holes, and sand the plugs flush.



7 Cut the ramp (J) to length from a 2×10, cutting one end at 21° where shown on the Exploded View drawing.

Final touches before ordering the sand

1 Sand the sandbox and toybox. Fill any imperfections (we used Minwax High Performance Wood Filler). Sand the filled areas.

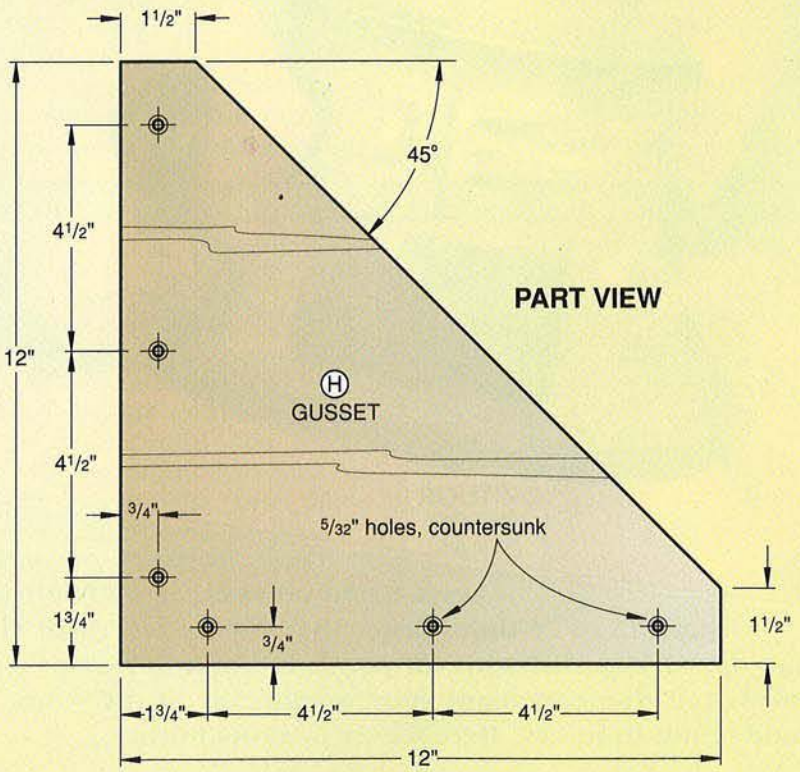
2 Apply a coat of primer to both assemblies (don't forget to paint the inside of the toybox garage). (See the box *below right* for painting particulars.) Paint the sandbox and toybox. (We used ACE Porch and Deck enamel).

3 For an added effect, detail-paint the windows on the toybox garage and the logo on the sandbox seat. For the seat logo, we used 5" stencil lettering.

4 Drill the screw holes and screw the toybox garage to the sandbox.

5 Position the lid on the toybox, and then clamp the continuous hinge in place. Screw the hinge to the bottom side of the lid and to the back side of the toybox.

6 Position and then screw the painted ramp in place. (We used galvanized screws to fasten the ramp to the garage front and to the side of the sandbox.)



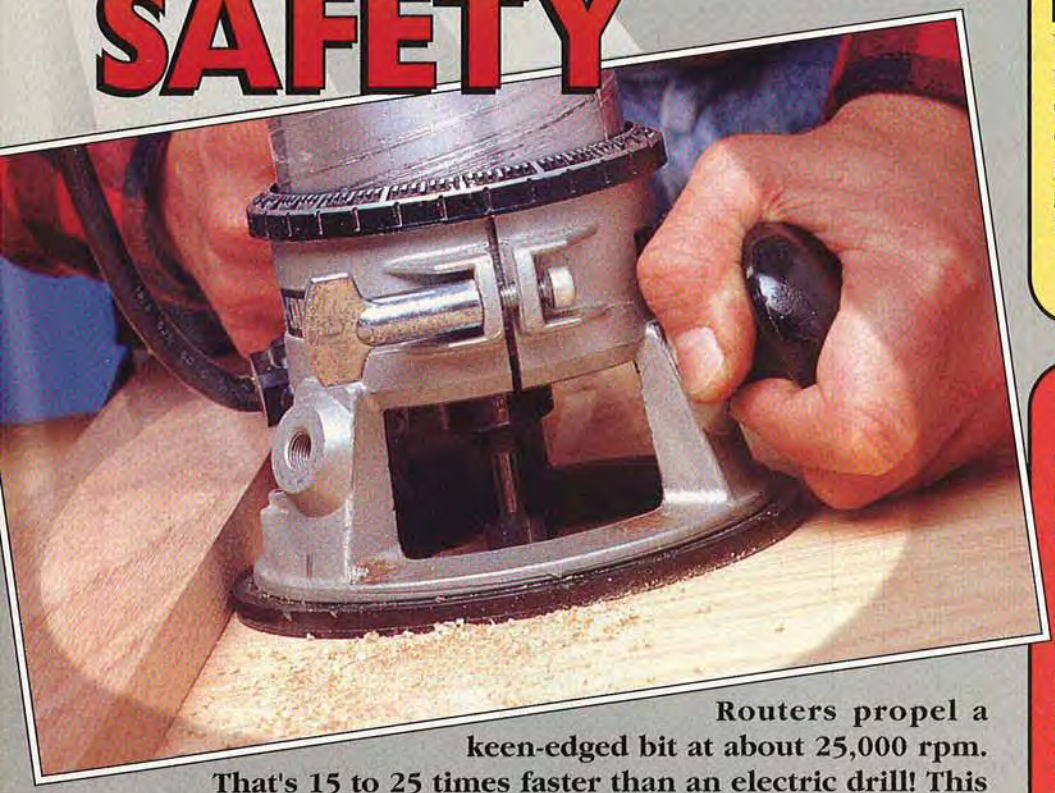
How we painted our sandbox

We first primed the toybox garage and sandbox pieces with one coat of an oil-based primer. We then applied two coats of an industrial oil-based enamel, letting each coat dry at least 24 hours. For the lettering and windows, we used an enamel paint. To paint the windows, we masked the outlines with masking tape, and removed the tape within an hour after painting. Left on too long, the tape will leave a sticky residue that's hard to remove.

Project Design: James R. Downing
Illustrations: Kim Downing
Photograph: Wm. Hopkins Photography

THEY'RE QUICK, EASY, AND VERSATILE, BUT ROUTERS CAN BE DANGEROUS, TOO.

SPOTLIGHT ON ROUTER SAFETY



Routers propel a keen-edged bit at about 25,000 rpm. That's 15 to 25 times faster than an electric drill! This high speed, coupled with torque, can result in loss of control that at the least mars your workpiece. At the worst, it could result in injury. Here's how to avoid both.

National statistics compiled by the U. S. Consumer Products Safety Commission point to routers as the cause of accidents for 2,500 emergency-room users in a recent year. Nearly two percent of these required hospitalization. Of course, those statistics scarcely stack up to yearly accidents attributed to the tablesaw—nearly 30,000. Yet, surgeons who face workshop injuries in operating rooms agree that routers generally inflict more difficult-to-repair wounds.

To help you get full enjoyment from your woodworking—and peace of mind while using your router—here's sound advice assembled from the safety professionals at the Power Tool Institute, a national trade association for tool manufacturers. We have also drawn from our own workshop experience here at *WOOD*® magazine.

SAFETY

Inside your shop, what you wear can directly contribute to your safety. So by all means, dress comfortably, but follow the rules.

- Always don safety goggles or prescription safety glasses with side shields, or a full-face shield. (Even with protection, always keep your face and eyes away from a spinning bit.)

PROCEED

Your router may seem like a snap to operate, but looks can be deceiving. So before you begin cutting, become familiar with the parts of your router as diagrammed in the owner's manual, then follow these precautions:

- Be sure that your router is unplugged—not just turned

BEWARE:

There isn't a power tool that compares with a router's usefulness when it's used properly. However, there are few tools that can surprise you more. So, like a scout, be prepared.

- Secure all clamping devices on your workpiece—as well as those that hold your workpiece—before doing any freehand routing. Likewise, secure all fences and jigs before routing on a router table.
- If you use your router mounted in a router table, make sure the tool is tightly fastened in place, with guards in position and a pushstick and/or pushblock close at hand.
- Always check to make certain that the router's clockwise rotation is cutting with the grain of the wood, or like a car that suddenly gains traction in the mud, it can leap. This will help you remember: In freehand routing, when you hold the router before you on the stock (you, the

Print this article

CAN BE FASHIONABLE

•Wear hearing protection, even for short periods of router use. A router's screech can permanently damage your hearing. OSHA noise level charts indicate that a 105-dBA level (a special decibel measurement for noise) results in some hearing loss after even only one hour's exposure. Routers typically produce from 105–110 dBA. And they really wail when a bit starts to dull!

The type of protection you choose must therefore have a high enough noise-reduction rating (NRR) to lower the router's ruckus to a safer plateau. So you'll need hearing protection with at least a 20 NRR to reduce the sound to an acceptable 90 dBA. (Hearing protection, from plugs to muffs, carry their NRR printed on the packaging.)

•Never wear gloves, loose clothing, jewelry, or dangling objects (even hair) that may catch in rotating parts or accessories.

Now that you know how to dress for safety, here's how to get started with your router.

WITH CAUTION

off—when you change bits or set the depth of cut. And clear your worktable or router table of all tools and debris.

•Follow the tool manufacturer's recommended procedures for setting your router's depth of cut, and be sure to tighten all adjustment locks.

•Use the wrenches provided with your router to install router bits, and carefully read the owner's manual regarding the method.

•Be sure that the cutter shaft is properly engaged in the collet. Usually, that means bottoming out the bit in the collet, then raising it 1/16". An improperly installed bit can come out and be propelled at great speed in any direction.

•Flick the switch to the "off" position before you plug the router into the electrical outlet and when you disconnect it.

With these points under your belt, you're almost ready to rout. But there are still tips to follow.

ROUTER IN USE

router, the stock), it should always move from *left to right*. On a router table, because the tool is inverted and the stock is directly in your hands (you, the stock, the router), you move the stock from *right to left*. Paint a feed-direction arrow on your router table as a direction reminder.

•Keep your hands away from the cutter area when you plug the router in and turn it on.

•Because of the torque a router produces, keep a firm grasp with both hands *only* on the handles and gripping surfaces provided by the manufacturer.

•On some types of cuts, table-mounted routers can pull your fingers into the bit. The drawings, *right* show you two safe setups that avoid this possibility.

•If possible, always turn the cutter opening on the router away from your body while routing. If your router has a chip shield over the opening, see that it is properly and securely installed.

•Never use a dull bit. It adds to the router's work load, and if pushed, it may break and fly off.

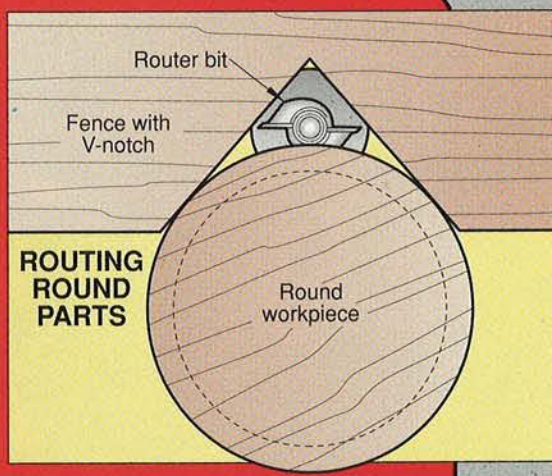
•With a carbide cutter bit, start the router beneath the workbench or workpiece to protect yourself from a flying cutter piece should the carbide be cracked.

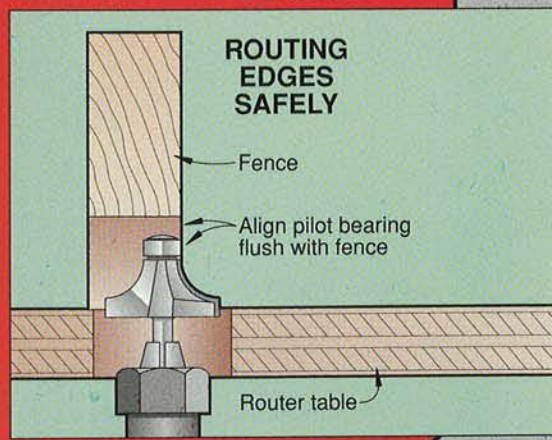
•For greatest control, allow the router to reach full speed before feeding it into the wood. Never begin routing with the bit in place against the wood, and never force a router into the wood when you're making a shaping cut.

•Never attempt to remove debris from a spinning bit router with your fingers.

•Keep the base of the router and its whirling cutter bit away from you when removing it from the workpiece. Let it come to a full stop before setting it down, and then always lay the router on its side clear of any clutter.

•Let the bit and collet cool down after routing and before making any changes.

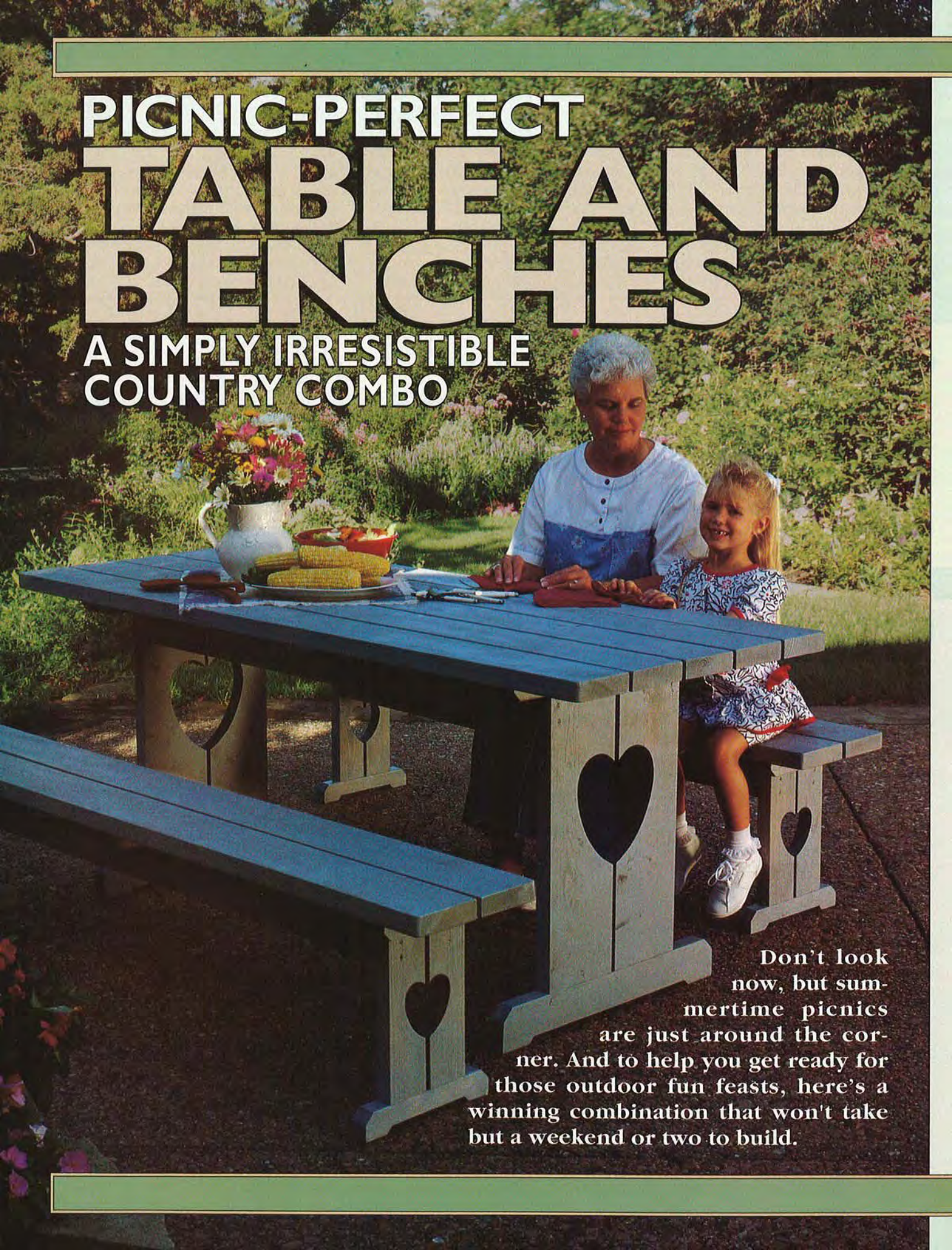




Written by Peter J. Stephano Photograph: King Au Illustrations: Mike Henry; Kim Downing

PICNIC-PERFECT TABLE AND BENCHES

A SIMPLY IRRESISTIBLE COUNTRY COMBO



Don't look now, but summertime picnics are just around the corner. And to help you get ready for those outdoor fun feasts, here's a winning combination that won't take but a weekend or two to build.

Note: *For our picnic table and benches, we hand-picked fir 2× stock. Pine, spruce, or redwood also will work well. For joints that will stand up to the extremes of Mother Nature, use Titebond II water-resistant glue, slow-set epoxy, or resorcinol glue.*

Begin with the table end panels

1 From 2×8 stock, cut the end uprights (A) to length.

2 Transfer the larger full-sized heart half-pattern onto a piece of heavy paper or poster board. Cut the full-sized template to shape.

3 Position the template, and trace the heart outline on all four uprights (A) 10⅞" from the bottom edge of each where located on the Table End Section View drawing. Cutting just inside the marked outlines, cut the half patterns to shape on a bandsaw or jigsaw. Then, drum-sand to the line to remove saw marks.

4 Cut the feet (B) and top rails (C) to the lengths listed in the Bill of Materials from 2×4 stock.

5 Mark the cutlines and cut the ends and bottom of the feet to shape. Chamfer the ends of the tops rails where shown.

6 Clamp each matching pair of uprights (A) together, heart edge to edge, with the top and bottom edges flush and a couple of ½" spacers between the parts. Using the dimensions on the Table End Section View drawing, mark the dowel-hole centerlines on the bottom ends of the uprights. Using a square, transfer the dowel-hole centerlines to the mating top edges of the feet. Drill the mating holes in the top edges of the feet (we used a spade bit).

7 Crosscut eight 3" lengths of ¾" dowel stock. For ease of insertion, sand a chamfer on both ends of each dowel.

8 Glue, dowel, and clamp each pair of uprights (A) to the feet (B).

9 Clamp the top rails to the top end of the uprights. Drill the mounting holes, and screw the rails to the uprights. Set the middle top rail (C) aside for now; you'll add it later.

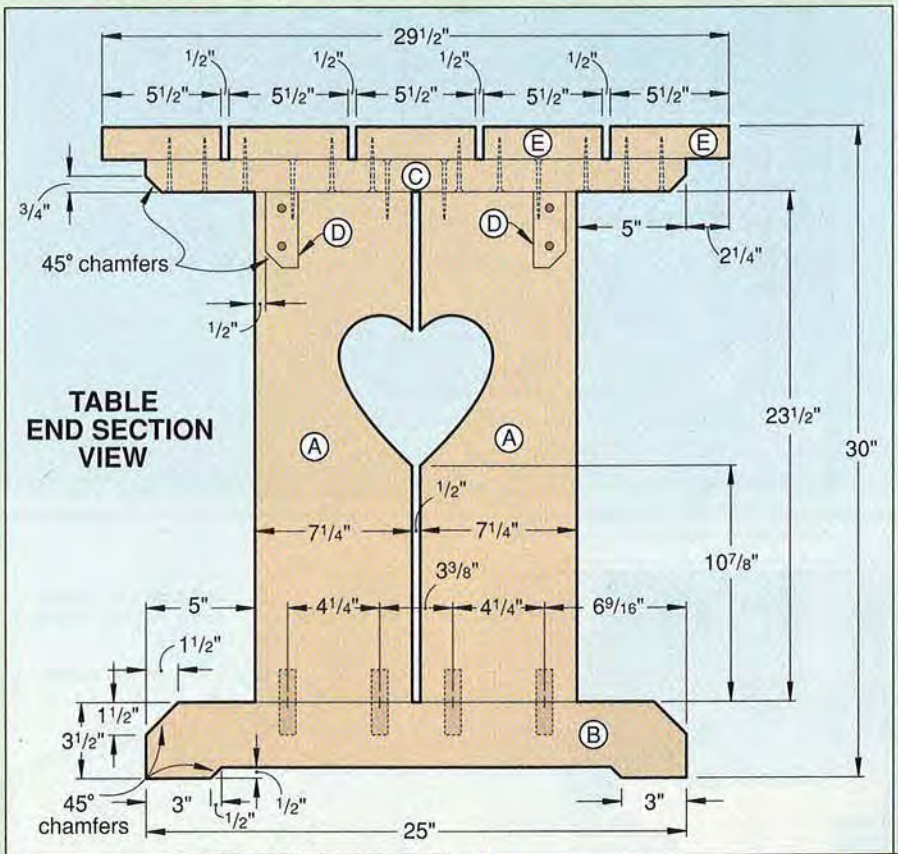
Add the stretchers and tabletop pieces

1 Cut the stretchers (D) to length from 2×4 stock and the tabletop pieces (E) from 2×6 stock.

2 Bevel-rip a 45° chamfer along one edge of each stretcher where shown on the drawing at *left*.

3 Rout or sand ⅛" round-overs along all edges and ends of the tabletop pieces.

Continued



Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
TABLE					
A uprights	1½"	7¼"	23½"	2x8	4
B feet	1½"	3½"	25"	2x4	2
C top rails	1½"	3½"	25"	2x4	3
D stretchers	1½"	3½"	51"	2x4	2
E tabletop	1½"	5½"	72"	2x6	5

Materials Key: choice of fir, pine, spruce, or redwood

Supplies: ¾" dowel stock, 2½" deck screws, 3" deck screws, 3¾" deck screws

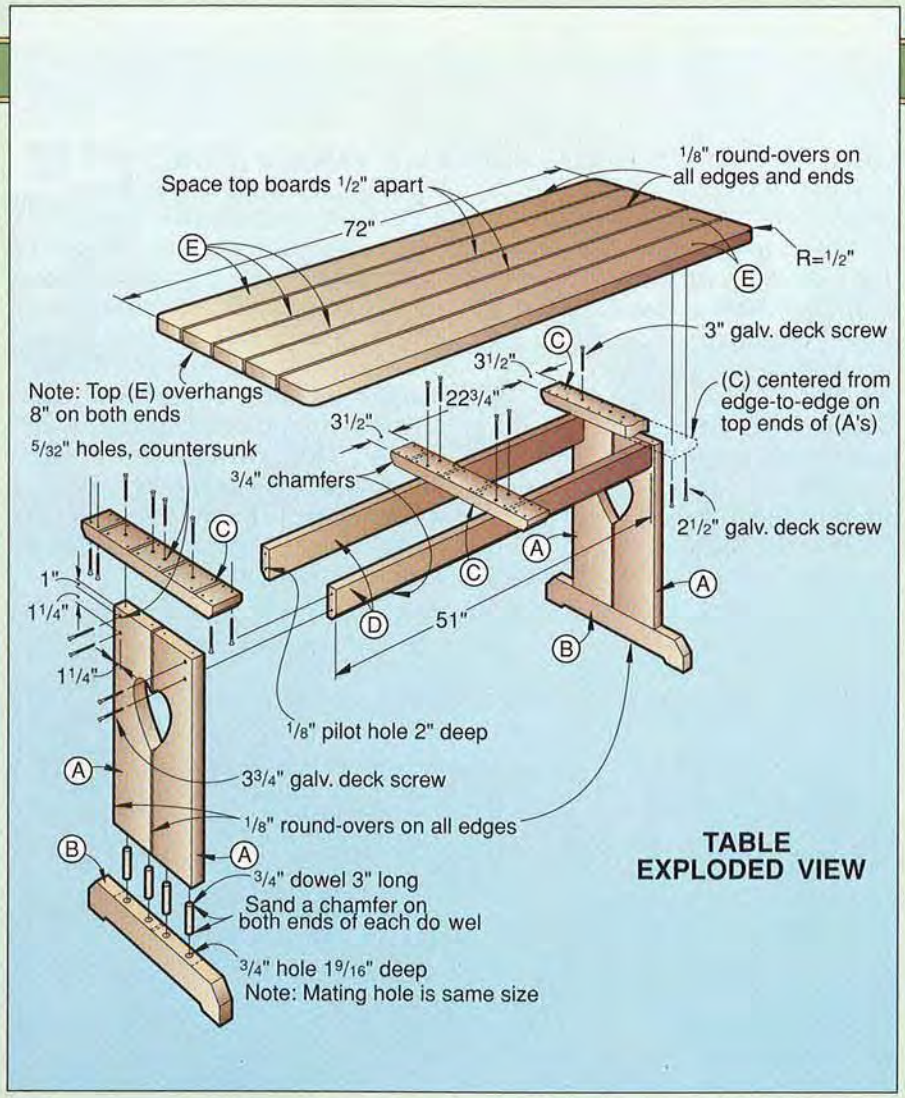
BUYING GUIDE

Bench, chair, and table plans. For a 17×22" plan of the three accompanying pieces, send $9.95 to Comfy Country Trio WOOD PLANS, P.O. Box 9255, Dept. WD-23, Des Moines, IA 50306 (shipping and handling, plus state and local taxes if applicable included).

4 Clamp the stretchers between the end panels where shown on the Table End Section View and Table Exploded View drawings. Drill mounting holes and screw the stretchers in place to complete the base assembly.

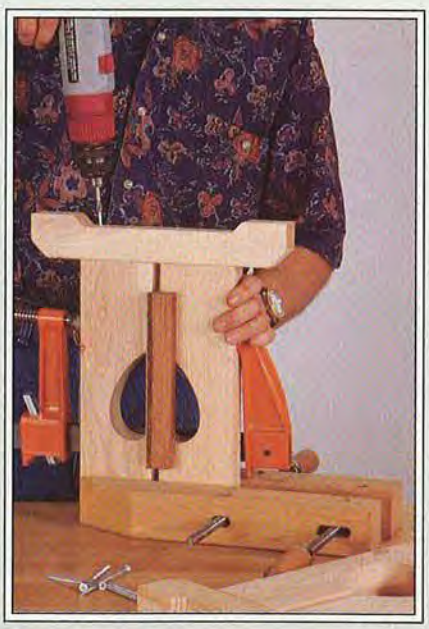
5 Position the tabletop pieces *good face down* on sawhorses or on your workbench. Using ½" spacers between the 2×6s, clamp the tabletop pieces together with the ends being flush. Position the base assembly, also upside down, centered from side-to-side and end-to-end on the tabletop pieces. Now, clamp the top rails (C) to the tabletop pieces. Drill mounting holes and screw the two assemblies together. Clamp the remaining top rail (C) centered on the bottom of the tabletop pieces. Drill the pilot holes and screw it in place. Position the table upright on the floor.

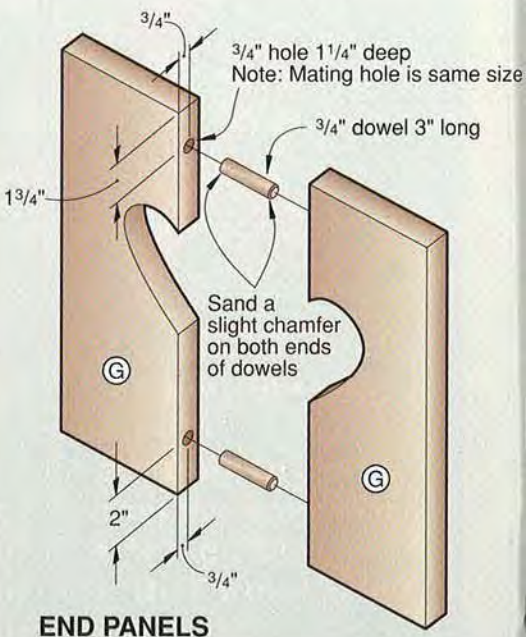
6 Mark and then cut a ½" radius on each of the four corners of the tabletop. Sand each corner smooth to remove the saw marks. Rout ⅛" round-overs on the four radiused corners.

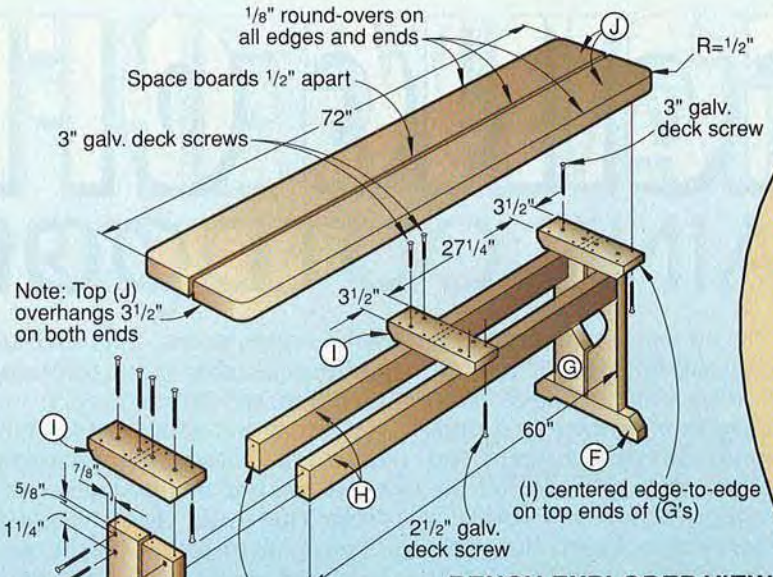

1/8" round-overs on all edges and ends
Space top boards 1/2" apart
72"
R=1/2"
3" galv. deck screw
3 1/2"
22 3/4"
(C) centered from edge-to-edge on top ends of (A's)
Note: Top (E) overhangs 8" on both ends
5/32" holes, countersunk
3/4" chamfers
2 1/2" galv. deck screw
1"
1 1/4"
1 1/4"
51"
1/8" pilot hole 2" deep
3 3/4" galv. deck screw
1/8" round-overs on all edges
3/4" dowel 3" long
Sand a chamfer on both ends of each do wel
3/4" hole 1 9/16" deep
Note: Mating hole is same size
TABLE EXPLODED VIEW

The built-to-last benches come next

To make the benches, use the same construction process used to build the picnic table. See the Benches Bill of Materials for sizes. Note that the narrower feet (F) on the benches allowed us to go with screws instead of dowels to secure the feet to the bottom end of the uprights (G). See the photo *at right* for reference. Also, parts F and H are ripped to width from 2×4 stock. Finally, use the small heart pattern on the *opposite page* for the bench uprights (G).







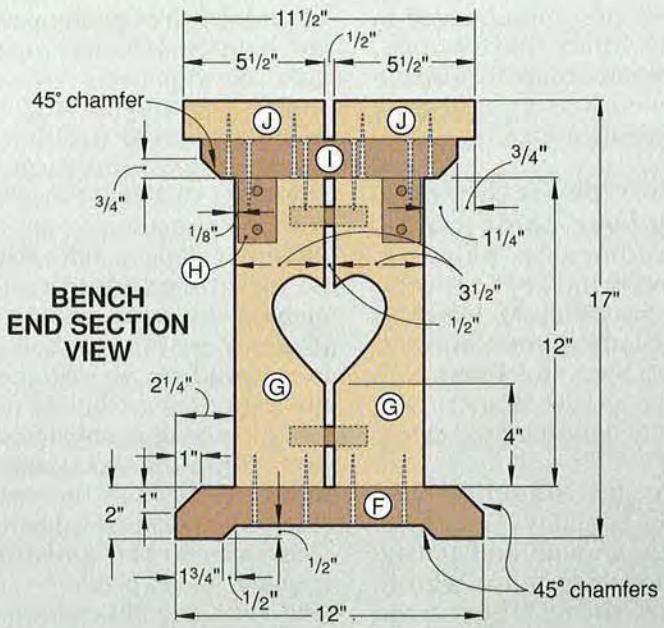
BENCH EXPLODED VIEW

Bill of Materials

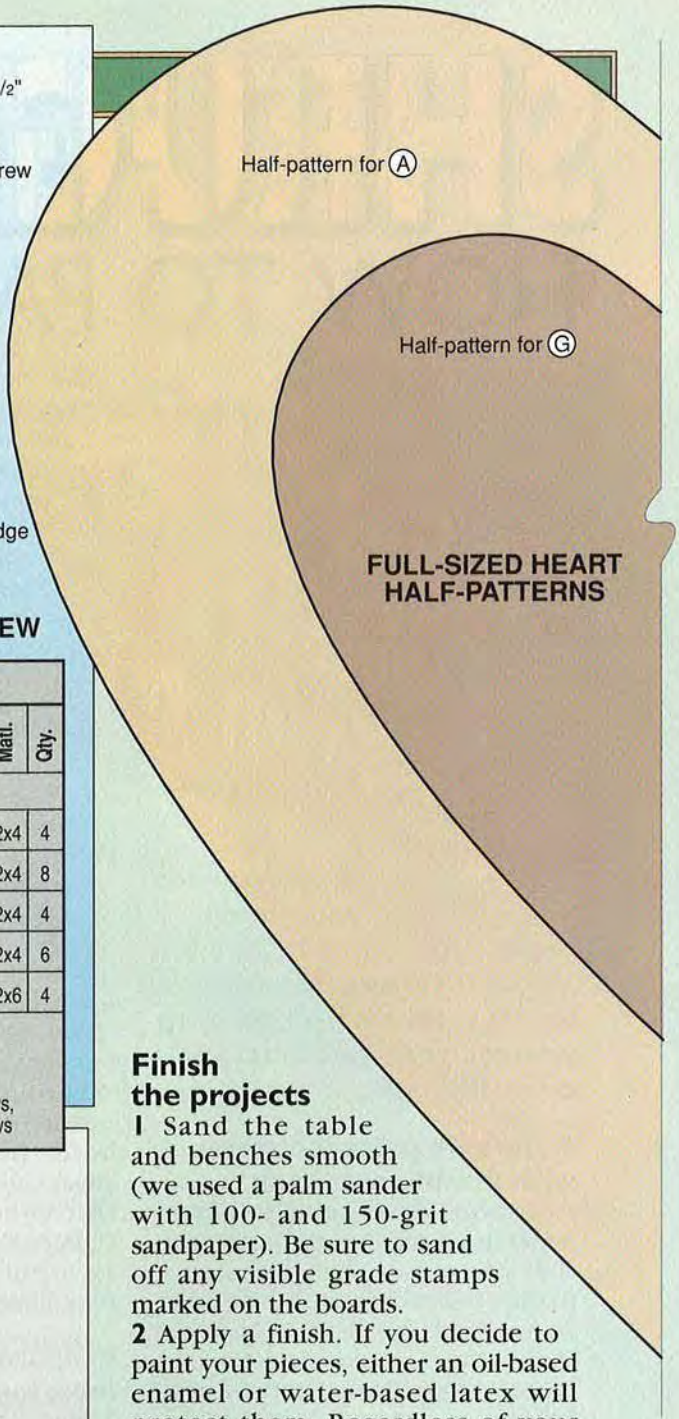
Part	Finished Size T	W	L	Matl.	Qty.
TWO BENCHES					
F feet	1½"	2"	12"	2x4	4
G uprights	1½"	3½"	12"	2x4	8
H stretchers	1½"	2½"	60"	2x4	4
I top rails	1½"	3½"	10"	2x4	6
J bench tops	1½"	5½"	72"	2x6	4

Materials Key: choice of fir, pine, spruce, or redwood

Supplies: ¾" dowel stock, 2½" deck screws, 3" deck screws, 3¾" deck screws



BENCH END SECTION VIEW



Finish the projects

1 Sand the table and benches smooth (we used a palm sander with 100- and 150-grit sandpaper). Be sure to sand off any visible grade stamps marked on the boards.

2 Apply a finish. If you decide to paint your pieces, either an oil-based enamel or water-based latex will protect them. Regardless of your paint selection, be sure to apply a prime coat compatible with the top coat. Also, be sure to apply several coats to the porous end grain. For a more natural look, apply an exterior stain and several coats of spar varnish or other exterior sealer compatible with the stain. Be sure to choose an exterior finish with an ultra-violet inhibitor.

Produced by Marlen Kemmet
Photographs: John Hetherington
Illustrations: Kim Downing; Roxanne LeMoine

SHRUGGING OFF
HOW TO PAINT OUTDOOR

What woodworkers need to know

You may not think of your yard as a harsh environment. But for wooden things, it sure can be. Try these tips to help protect your outdoor projects with paint.

A durable paint job starts with lumber selection

How well your paint job lasts depends in part on the first decision you make when you start a project—which wood to use. Some woods just hold paint better than others, according to data from the Forest Products Laboratory, operated by the U.S. Department of Agriculture Forest Service in Madison, Wisconsin. The table on the *opposite page* ranks some common softwoods and hardwoods for their paint-holding ability, with group I being the best.

Softwoods with narrow bands of summerwood (the dark portion of the grain, also known as "latewood") and fine-grained hardwoods (those with small pores) generally hold paint better. So do superior lumber grades—stock without pitch streaks and pitch pockets and with fewer knots.

Knots may fall out, of course, and large ones usually crack. Being mostly exposed end-grain, they absorb paint and create dull spots in the finish, the Forest Products Laboratory points out. And, pitch can discolor paint. If you can't avoid knots, seal them with shellac or a sealer-bonder such as XIM (available from paint dealers) before painting.

The wood's moisture content affects paint longevity, too. Painting wood that has over 20 percent moisture content usually results in blistering and peeling. Generally, seasoned wood that has acclimated to the area where it will be used holds paint best.

How the log was sawn into lumber makes a difference, as well, according to the Forest Service researchers. Quartersawn material holds paint best—though the advantage is more pronounced in softwoods than hardwoods. (Lumber dealers refer to quartersawn softwoods as vertical-grain or edge-grain boards).

Preparation paves the way for a long-lived paint job

When it comes to painting, "preparation is the key to success any time," says Rick Middleswart of Yount-Glade Paint Center, a Benjamin Moore and Pittsburgh Paint dealer in Des Moines. "But it's especially important for exterior painting."

Wood stretches and shrinks due to changing humidity. Paint must stick tightly enough and remain flexible enough to move with it. Outdoors, things get even tougher. Out there, the paint has to fend off nature's relentless assault—extreme heat and cold, wind, rain, snow, ice, airborne pollutants, damaging ultraviolet radiation, and more.

"Paint won't stick very well to the hard, glossy, planed surface most lumber has when it comes from the mill," Rick explains. "You have to rough up the wood to give it some tooth." Sanding to 100-grit or so will do that.

Applying a paintable water repellant or water-repellant preservative to the bare wood before painting extends paint life. Allow the coating to dry thoroughly—it might take two days or more—before proceeding.

Oil-base primer: the best agent for undercover work

Rick always recommends an alkyd (oil-base) exterior primer for outdoor work on previously unpainted wood. Applied over properly prepared wood, the undercoat provides a sound base for any kind of topcoat. "Don't try to get by with leftover interior wall paint for primer—it isn't up to the task," he warns.

Apply one smooth, uniform coat of primer onto the dry wood. Cover all exposed surfaces and any parts that will be in contact with the ground.

Whether to paint sides that won't be directly exposed to the elements—the underside of a tabletop, for instance—has always been good for an argument. "In my experience, there's no problem in leaving it unpainted," Rick says. "True, the wood may absorb moisture through the unpainted side, but it also breathes through that side, so the moisture isn't trapped," he explains.

Bill Feist, the PhD who heads up exterior paint research at the Forest Products Lab, concurs. He suggests nothing more than a

THE WEATHER PROJECTS

primer coat on unexposed surfaces. "You can prime everything, but don't topcoat those backs and undersides," he counsels.

"If you seal up all of the wood surface with coats of paint, it can't breath. Then, moisture in the wood will blister and peel the paint," Bill says. If you think your paint job will keep moisture out of the wood, think again. "Moisture *will* get in, no matter how hard you try to keep it out," Bill comments.

Two topcoats provide top-notch protection

Cover the alkyd primer with two topcoats, either latex or oil base. If you want a glossy finish, Rick suggests an oil-base enamel. "Its harder film holds a shine longer outdoors," he maintains. Otherwise, use whatever type of paint you prefer. Bill likes latex topcoats; he says they remain flexible longer.

Brushing usually gives better results than roller, spray, or pad-application, especially for the first coat, studies by the Forest Products Lab indicate. Apply a smooth, even coat, flowing the paint onto the surface rather than scrubbing it into the wood.

And, don't lay on extra-heavy coats, expecting better protection. Thick coats will probably crack, resulting in less protection for your handiwork. Ideally, the dried coating—primer and both topcoats—will be about as thick as a sheet of newspaper.

Expect a gallon of paint to cover about 400 square feet, although that can vary. Heed the paint manufacturer's recommendation for drying time between coats, then put on the final coat.

ELEMENTS OF A LONG-LASTING EXTERIOR PAINT JOB
START WITH DRY, SOUND STOCK (CHOOSE SPECIES BASED ON PAINT RETENTION RANKINGS)
BRUSHED-ON ALKYD EXTERIOR PRIMER
FIRST TOPCOAT
FINAL COAT
QUARTERSAWN STOCK
SMALL, TIGHT KNOT SEALED BEFORE PAINTING
SURFACE SANDED TO BREAK MILL GLOSS

How wood species rank for paint retention

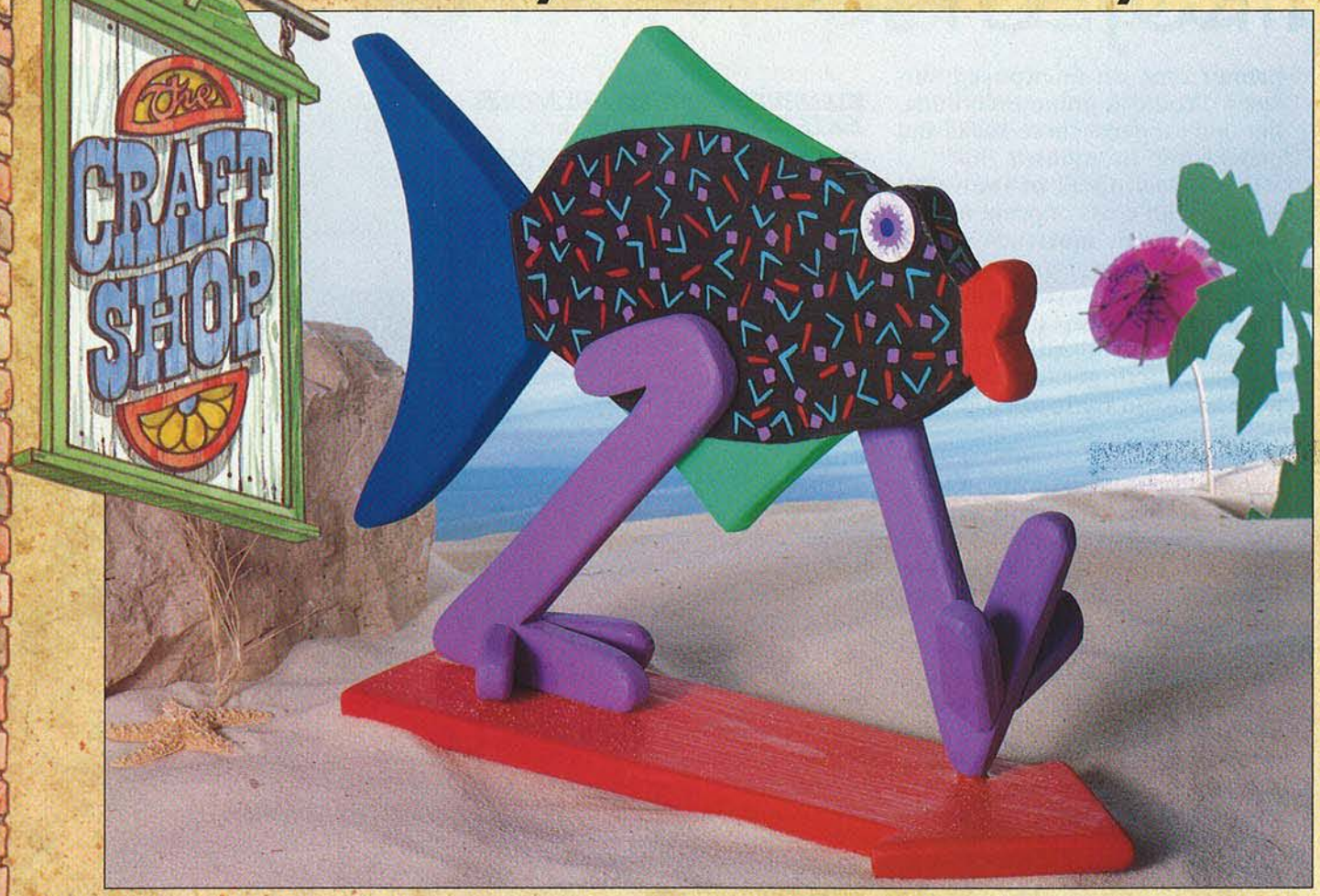
Here's how some popular woods stack up for paint retention, starting with the best.

- **I:** Cedar, cypress, and redwood.
- **II:** Eastern white pine, western white pine.
- **III:** Ponderosa pine, spruce, western hemlock, and white fir (softwoods); aspen, basswood, cottonwood, and yellow poplar (hardwoods).
- **IV:** Douglas fir, southern yellow pine (softwoods); birch, gum, Lauan plywood, maple (hardwoods).
- **V:** Ash, elm, oak, and walnut.

Illustration: Brian Jensen

A FISH OUT

Daffy, but definitely fun



You'll have a hard time keeping a straight face while you cut out, glue together, and paint this odd cod. Making up stories about it for your friends should be good for a few chuckles, too.

Enlarge the body, leg, toe, and base patterns on the *opposite page* at 200 percent. Trace the patterns, including two long toes and two short toes, onto your stock. (We used standard 1×6 and 1×12 pine for our fish—you could use any ¾"-thick stock, including hardwoods.) Lay out the circles for the eyes on ⅛"-thick material, such as Baltic birch plywood.

Bandsaw or scrollsaw the parts. A ¼" bandsaw blade will do the job. For scrollsawing the pieces, fit a reverse-tooth blade to the machine for a cut that's splinter-free on both sides.

Mark the angle where shown on the straight end of the toes, and cut or sand to the line. Round over the edges of all parts with a rasp or coarse sandpaper, then finish-sand all parts.

Mark the location for the leg on each side of the body so you can leave unpainted spots to glue the legs to. Mark corresponding areas on the legs.

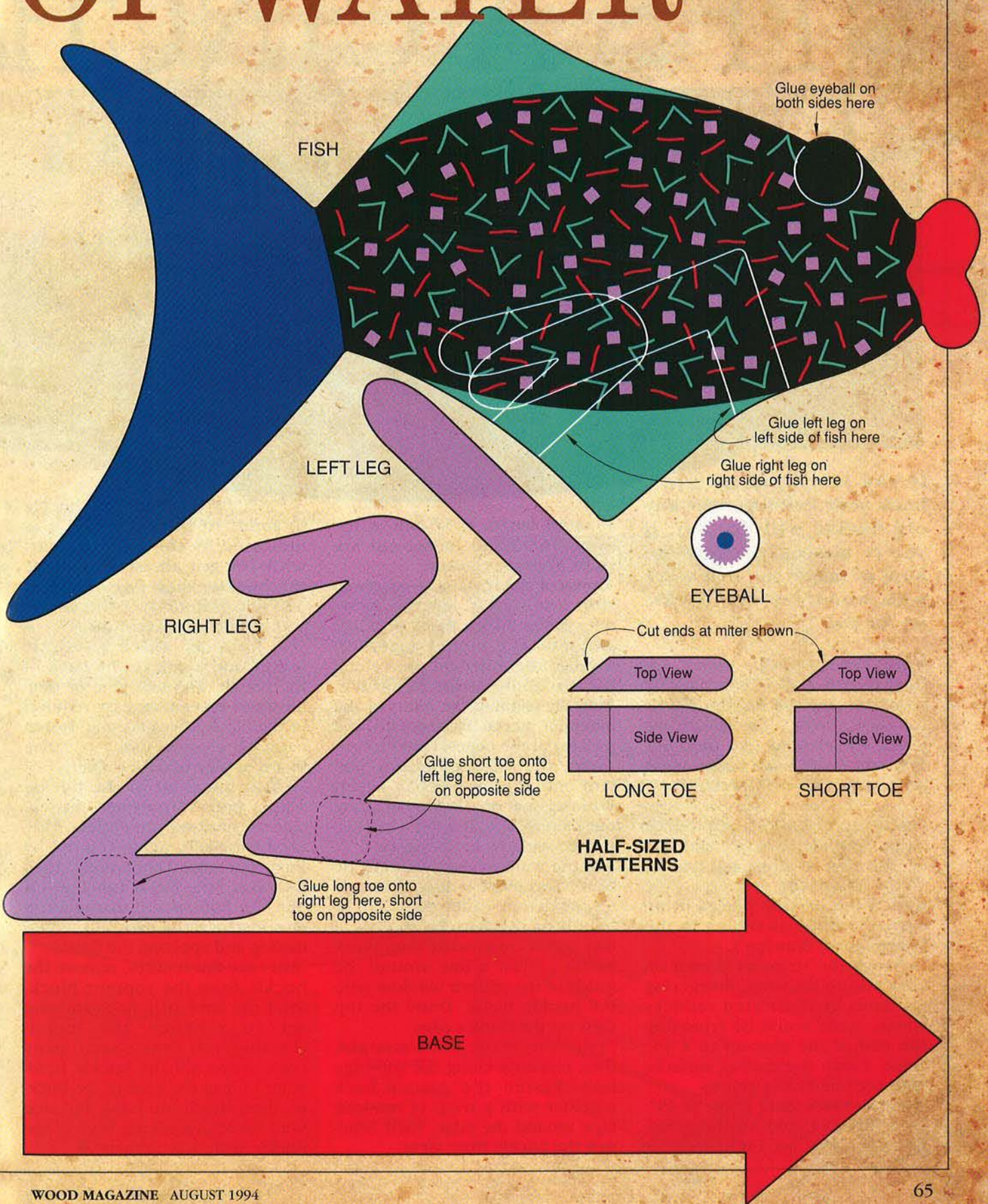
Glue the toes to the legs where shown. Then, prime all parts, leaving unpainted gluing areas for the legs and eyes. White acrylic gesso, available from art-supply dealers, works great for a prime coat on wooden projects.

Paint the fish and base with acrylic artist's colors. Follow the color scheme shown or let your own vision guide you as you decorate the fish.

Glue the legs to the fish, taking care to place the feet on the same level. Stand the fish on the base and mark the contact points between the legs and the base. Carefully scrape paint away at those locations, and glue the fish to the base.

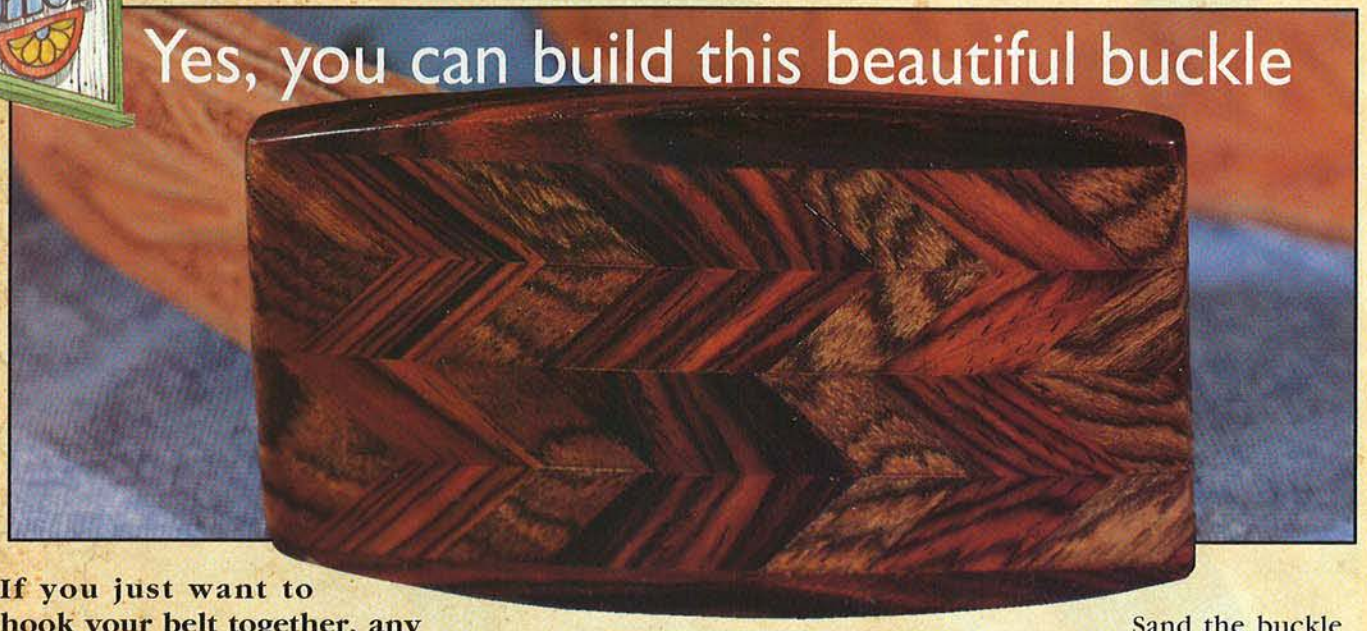
Project Design: © Kathleen Sharkey 1992
Photograph: John Hetherington
Illustrations: Kim Downing

OF WATER


FISH
Glue eyeball on both sides here
LEFT LEG
Glue left leg on left side of fish here
Glue right leg on right side of fish here
EYEBALL
RIGHT LEG
Cut ends at miter shown
Top View
Side View
LONG TOE
Top View
Side View
SHORT TOE
Glue short toe onto left leg here, long toe on opposite side
HALF-SIZED PATTERNS
Glue long toe onto right leg here, short toe on opposite side
BASE

IT'S A CINCH

Yes, you can build this beautiful buckle



If you just want to hook your belt together, any old buckle will do. But, if you're aiming to show the kind of magic *you* can work with wood, try this buckle on for size.

***Note**: For the buckle shown, we started with 1×3×12" bocote and cocobolo (see the Buying Guide for our source). The blank we glued up yielded two buckles. You can build your buckle with any combination of species.*

From the cocobolo, rip three strips ¼" wide, two ⅜", and one ½". Rip two ¼" strips and two ⅜" strips from the bocote. (We ripped the narrow pieces using carrier boards, as shown in the Carrier Board drawing.)

Arrange the strips as shown on the Glue-up drawing. Staggering the ends as illustrated reduces waste, since you'll be trimming the end of the glue-up to a 45° angle. Clean the mating surfaces with acetone before gluing.

Set your saw's miter gauge to 45°, then slice one end off the glued-up stock. Now, set a stopblock for a cutting length of ⅜" and, at the same 45° angle, miter-cut six strips from the glue-up.

Crosscut the remaining cocobolo strip into two 6" lengths. Now, refer to the Buckle Blank drawing, and glue the pieces together. Arrange the miter-cut pieces and the cocobolo strips as shown, carefully aligning the joints in the miter-cut pieces. Place scrapwood packing at the edges, then clamp.

Trace the full-sized buckle pattern onto a plain piece of paper. With scissors or a knife, cut along the pattern line, leaving a buckle-shaped window in the paper.

Lay the window over your buckle blank, and move it around to center the design. (Alter the width or length of the pattern slightly if that will accommodate your blank better.) Draw a line around the inside of the pattern window onto the buckle blank. Draw the top view on the blank's edge.

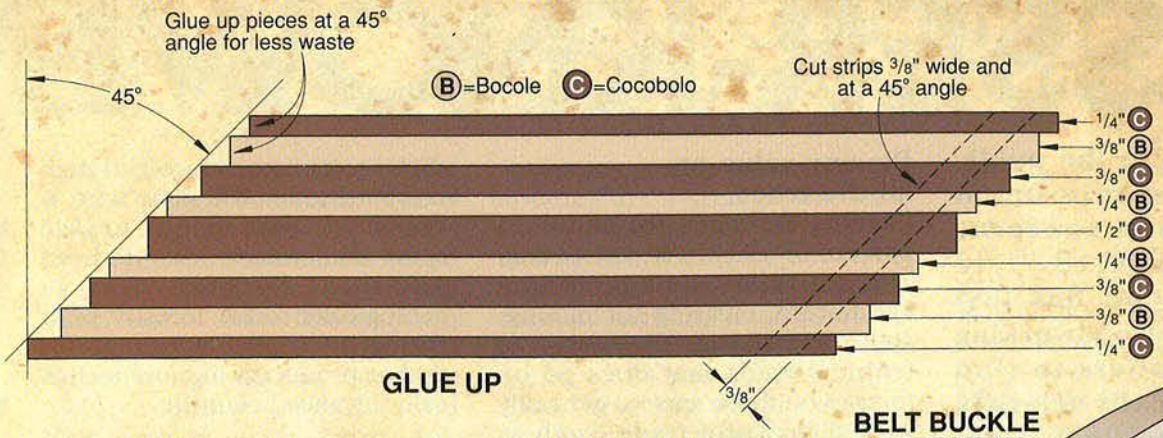
Trim the blank ends straight, then bandsaw along the top-edge line. Fasten the pieces back together with a wrap of masking tape around the edge, then bandsaw the buckle front view.

Sand the buckle to about ¼" thick, curving it as indicated by the pattern. Start with 100-grit abrasive to shape the buckle, then finish-sand to 320-grit. Round over the edges, and corners to prevent snags.

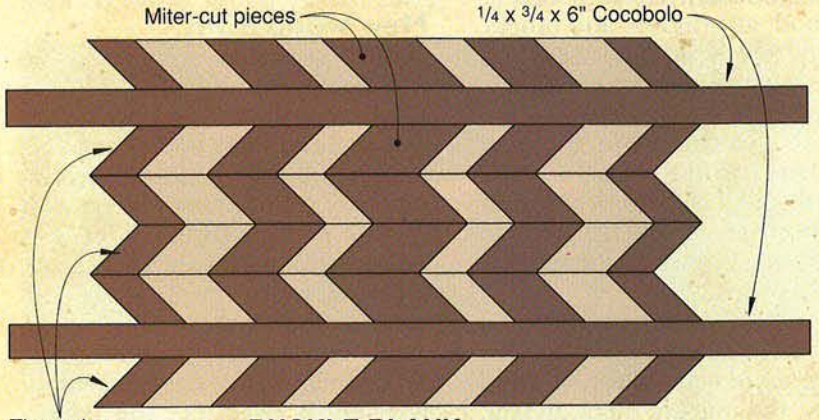
For finishing, attach a ¾×¾×1" scrapwood block to the back of the buckle. Hotmelt glue or double-faced tape allow easy removal of the block after finishing. Fasten each block to a piece of cardboard or plywood for stability.

Finish the front of the buckle with a pour-on polymer coating, sold by craft-supply dealers. (We used Ultra-Glo, manufactured by Environmental Technology, Inc., P.O. Box 365, Fields Landing, CA 95537.) Follow the manufacturer's instructions carefully when mixing and applying the finish.

After the finish cures, remove the buckle from the support block. Sand the back of a hook-and-ring set to roughen the metal. (Leathercraft dealers and many craft shops sell the buckle hardware.) Clean the back of the buckle, then attach the hook and ring with epoxy. Finish the back of the buckle with polyurethane.

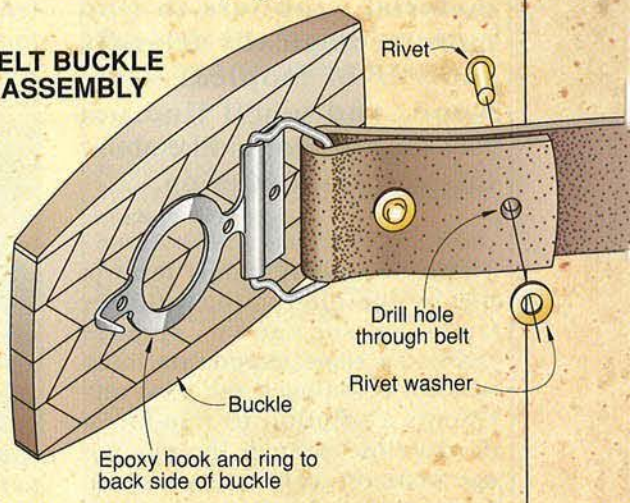


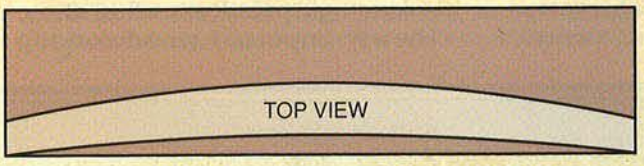
GLUE UP

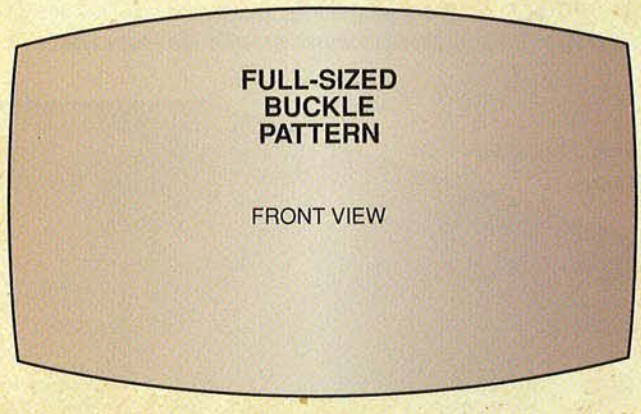


BUCKLE BLANK

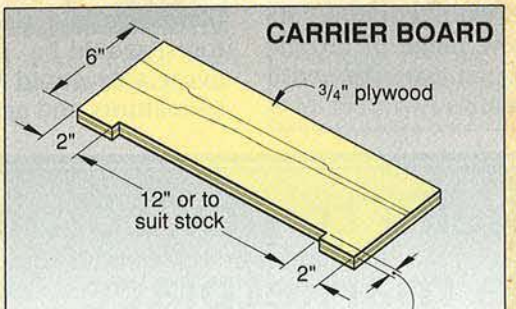
BELT BUCKLE ASSEMBLY





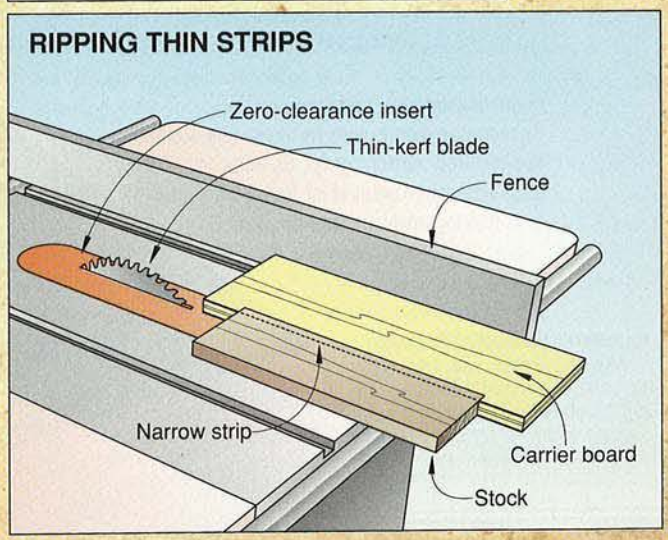


CARRIER BOARD



Notch width equals width of strip to be ripped. Make three carrier boards, one with 1/4"-wide notch, one 3/8" and one 1/2"

RIPPING THIN STRIPS



Buying Guide

Stock. Bocote, cocobolo, two 1×3×12" each, $23 ppd. in U.S. Calif residents add $1.72 tax. Tropical Exotic Hardwoods, Box 1806, Carlsbad, CA 92018. Or call 619/434-3030

Project Design:
© Frank Aubry
Photograph:
John Hetherington
Illustrations:
Kim Downing

LESSER-KNOWN

In a response to the public outcry against rain-forest destruction and concerns about endangered tree species, a trend has just begun among woodworking material suppliers to find more ecologically friendly sources of tropical hardwood. And you'll find out that there's a lot to like about this new stock offering.

Print this article

There's a relatively new term in use by the international timber trade—lesser-known species (LKS). To some experts on international economics, the term represents a solution to rain-forest destruction through the encouragement of sustained yield, an environmentally conscious form of forestry. To woodworkers, LKS represent a new range of intriguing stock to use in projects—with no guilt attached.

Placing value on all the trees

Logging accounts for about 25 percent of rain-forest destruction. The rest is due to slash-and-burn agriculture, clearing for mining, and road building. The harvest of tropical trees that does go on focuses on those species generally valued in world trade, such as rosewood, afrormosia, and others, known to woodworkers as exotics. So, with heavy machinery to move the logs and build the roads to get them out, loggers have traditionally cut a wide swath through the tropical forest. Unwanted trees are burned on site, cut into firewood, or just left behind as waste.

But if woodworkers placed a value on these also-ran tree species, more care might be taken to spare and nurture them. In fact, say many experts, if every tree in the forest had a dollar value, the forest would be managed so that every tree could be harvested at its maturity and greatest worth.

Yet, in any natural forest all trees don't mature at the same time. It can be managed, though, to yield some timber each year—forever. And that's sustained yield, an ecologically sound forestry practice well-accepted by responsible timber producers in more technically advanced countries.

New wood from sound sources

Private and non-profit agencies have recently sprung up to certify sustained-yield timber producers around the world as environmentally sound. That's the reason for the sudden surfacing of lesser-known species on the woodworking scene—these sustained-yield lumber sources must necessarily harvest all types of trees. To encourage this environmentally friendly practice, the lesser-known species must be bought, exported, and marketed to woodworkers along with familiar ones.

Although practically all of these newly imported woodworking

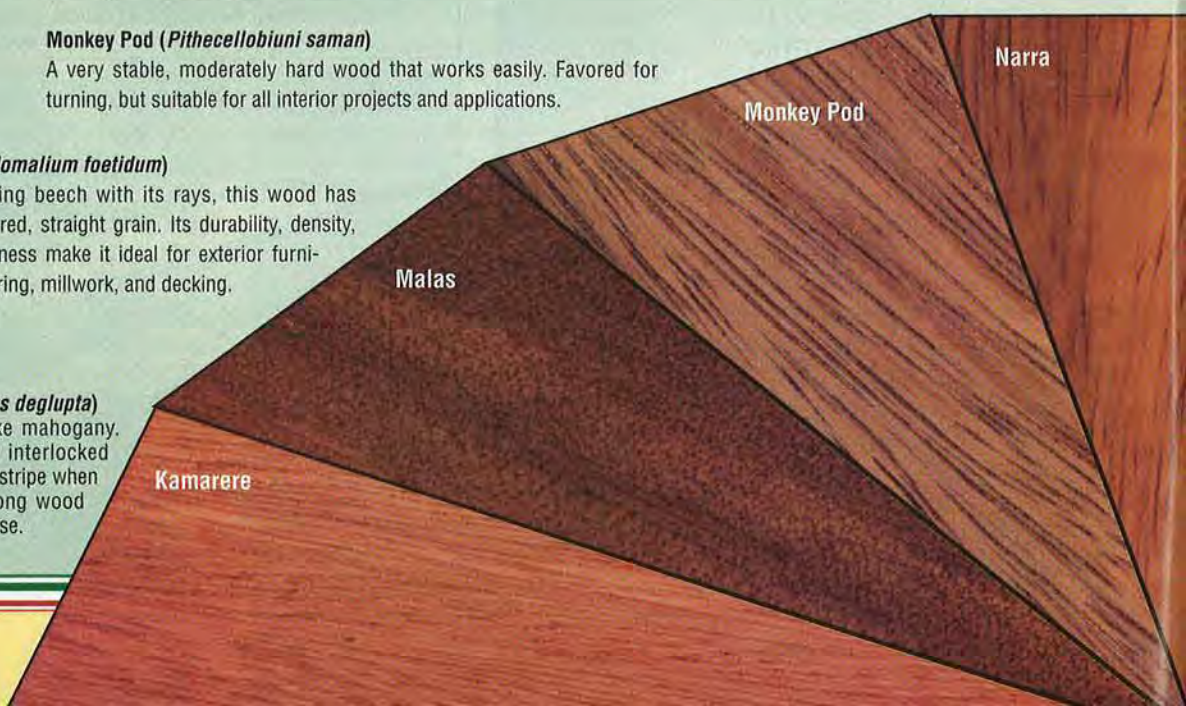
Say hello to newcomers in the marketplace

Narra (*Pterocarpus indicus*)
A member of the padauk family, this wood is as durable and good-looking as teak, and machines and finishes the same. Extremely stable. Same uses as teak.

Monkey Pod (*Pithecellobiuni saman*)
A very stable, moderately hard wood that works easily. Favored for turning, but suitable for all interior projects and applications.

Malas (*Homalium foetidum*)
Resembling beech with its rays, this wood has fine-textured, straight grain. Its durability, density, and hardness make it ideal for exterior furniture, flooring, millwork, and decking.

Kamarere (*Eucalyptus deglupta*)
Looks and works like mahogany. Straight but slightly interlocked grain features ribbon stripe when quarter sawn. A strong wood for general-purpose use.



SPECIES YOU MAY WANT TO TRY

woods have or once had traditional uses in their homeland, little is known about them elsewhere, thus their LKS name. On these pages, we'll introduce you to a select few of these lesser-known species from community-based forestry operations in New Guinea, South America, and Mexico. Some suppliers that carry these and other lesser-known species are listed in the box, *lower right*. Because they are new, and because considerably more effort goes into bringing them to market, retail prices of the species shown range from $4.50 to $8 per board foot, or about what you would expect to pay for exotic wood. Remember, though, that because many of the original sources for these woods are small-sized logging operations, the supply of the wood is often erratic. As a result, the dealers may not have the exact wood you want on hand when you order.

At a jungle site in Papua, New Guinea, local villagers gather to saw timber into boards for export. Such small operations do little damage to the environment as they introduce new species to the world's woodworkers.

Sources for lesser-known species and other woods

A&M Wood Specialty, P.O. Box 3204, Cambridge, Ontario, N3H 4S6, Canada. Sells environmentally friendly wood from New Guinea and Mexico as well as traditional woods. Write for details.

Berea Hardwoods, 6367 Eastland Rd., Brook Park, OH 44142. Sells ecologically certified Mexican and other hardwoods. Also sells North American hardwoods and standard exotics.

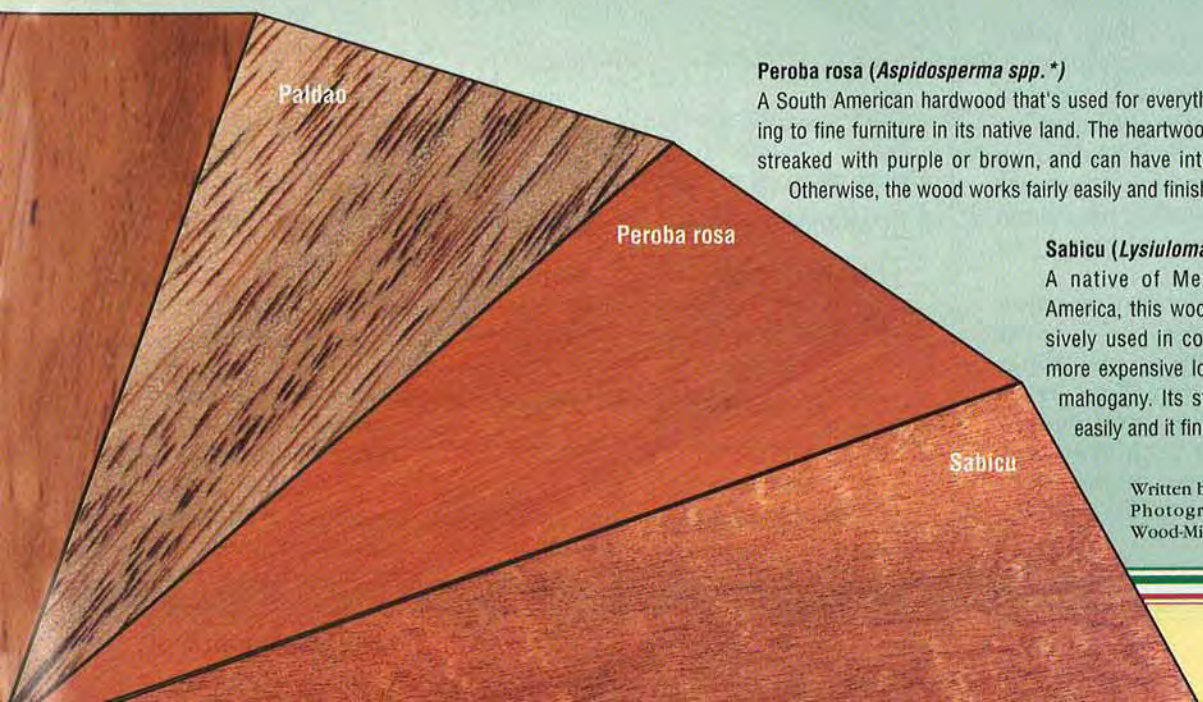
Eco Timber International, 350 Treat Ave., San Francisco, CA 94110-1326. Sells mainly to retailers. Will fulfill orders of 100 board feet or more to individuals and groups. Write for information and species price list.

Pittsford Lumber, 500 State St., Pittsford, NY 14534. Carries certified woods from cooperatives in Peru and Mexico. Write for prices and information.

Wise Wood, P. O. Box 1271, McHenry, IL 60050-4456. Carries a wide selection of wood from ecologically certified sources.

*Spp. indicates one of several species with nearly identical attributes.

Paldao (*Dracontolomelon puberulum*)
Sometimes called New Guinea walnut, this dense, durable, and stable wood from Southeast Asia has a rather coarse grain. Yet it machines and finishes beautifully to become fine furniture and cabinets.



Peroba rosa (*Aspidosperma spp.)**
A South American hardwood that's used for everything from flooring to fine furniture in its native land. The heartwood is sometimes streaked with purple or brown, and can have interlocked grain. Otherwise, the wood works fairly easily and finishes well.

Sabicu (*Lysiuloma spp.*)
A native of Mexico and Central America, this wood was once extensively used in combination with its more expensive look-alike, Honduras mahogany. Its straight grain works easily and it finishes smoothly.

Written by Peter J. Stephano
Photographs: Courtesy of Wood-Mizer, Inc.; King Au

THE GREAT SCROLLSAW DESIGN CONTEST©

HERE IT IS!

From *WOOD*® magazine, Weekend Woodworking Projects®, Super Scrollsaw Patterns™

•SCROLLSAWYERS, here's your chance to win as much as $1,500 in cash for your best original design.

•More than $5,000 in cash will go to contest winners.

•If you enjoy dreaming up original designs for scrollsaw projects, there's never been a better time to test your talents.

Show us your best work in these three categories

Send us your best original scrollsaw project for a chance at these great prizes. For judging, we'll divide entries into three categories—Put-Together Projects, Clever Cutouts, and Kids' Stuff.

Put-Together Projects will include items assembled from multiple scrollsawed parts, such as boxes or multi-layer plaques. Items may be either functional, such as clocks and weather stations, or purely decorative, such as wall hangings.

Anything cut from a single piece of wood—silhouettes and fretwork, for example—will fall into the **Clever Cutouts** category. A single cutout may be mounted on a base or plaque, and you may use a clock insert or similar hardware. Cutouts can be painted or unpainted.

Kids' Stuff entries may be either assembled projects or cutouts intended primarily as playthings or items for children. Toys, traditional jigsaw puzzles, and decorations suitable for a child's room would be just some of the items eligible for this group.

Five great cash prizes are up for grabs

We'll award five cash prizes totalling $5,250. Grand Prize, for the single best entry regardless of category, is $1,500.

In addition, the winner in each of the three contest categories will receive $1,000. And, the entry that best reflects a holiday theme (any holiday) regardless of category will win $750

Enter as many items as you like.

If it's scrollsawn, you can enter it

The scrollsaw must be the main or only tool used to build entries. If scrollsaw work merely serves as an incidental element or decorative accent, an item won't qualify.

Be sure to include a separate entry blank *below* (or photocopy of one) for each item entered. Entry deadline is November 30, 1994. Please read the rules on the *opposite page* before entering. Entries cannot be returned.

THE GREAT SCROLLSAW DESIGN CONTEST©

Sponsored by:
WOOD® magazine, Weekend Woodworking Projects®, and Super Scrollsaw Patterns™

Please place my entry in:

☐ Put-Together Projects

☐ Clever Cutouts

☐ Kids' Stuff

Name_____

Address _____

State _____ ZIP _____

Telephone _____

I certify that the enclosed entry is my original work.
Signature _____

Send to: Scrollsaw Project Contest, 1912 Grand Ave., Des Moines, IA 50309-3379

For best overall entry
GRAND PRIZE $1,500

Put-Together Projects
FIRST PRIZE $1,000

Clever Cutouts
FIRST PRIZE $1,000

Kids' Stuff
FIRST PRIZE $1,000

Best Holiday Theme
SPECIAL AWARD $750

Great Scrollsaw Design Contest Rules

1. Entries must be original, unpublished designs, not to include minor variations on published patterns or plans.
2. The scrollsaw must be the principal or only tool used for construction of entries.
3. Entries must be received at our offices by the end of the business day on November 30, 1994. All entries must be shipped prepaid; we will not accept collect shipments. Enclose an official entry blank (or photocopy) for each item. Label each item with your name and address. Entries cannot be returned.
4. By entering the contest, you grant your permission to use your name, hometown, and photographs of your entry for editorial or promotional purposes. Employees of Meredith Corporation, its affiliates and subsidiaries and employees' family members are not eligible.
5. Judging will be by a panel including representatives from the sponsoring publications, professional craftspeople, and scrollsaw manufacturers. Entries will be judged on originality and craftsmanship. Judges may reassign an entry to a different category. Judges' decisions are final.
6. Winners will be selected on or about Dec. 15, 1994, and notified by mail on or about Jan. 15, 1995. Taxes are sole responsibility of winners. For a list of winners, send a self-addressed stamped envelope to Scrollsaw Project Design Contest, 1912 Grand Ave., Des Moines, IA 50309-3379.
7. Subject to all local, state, and federal laws and regulations. Void where prohibited.

Super Scrollsaw Patterns™

BACK-ISSUE BONANZA

Fretful because you've missed a few issues of *WOOD*® magazine's Super Scrollsaw Patterns? Here's great news! Now, you can order those back issues to complete your set.

To order: Send your name, address, and the number of the issue(s) you wish to receive, plus a check or money order (U.S.) for $5.95 per issue. Postage and handling plus state and local taxes, if applicable, are included. Allow 4–6 weeks for delivery. Mail to:

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Please have issue numbers and credit card ready when placing order.

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A WORD ABOUT **JIGSAW BLADES**

Tooth set affects the quality and speed of your cut. Flat-set blades *(left)* cut smoothly. Side-set blades *(middle)* are best used for rough cuts or speed work. Wavy-set blades *(right)* work well on metal, plastics, and ceramics

The wrong blade will turn a great jigsaw into a poor performer. To get the most from your jigsaw, you need to match the blade to the work.

Jigsaw blades frequently break, and the best prevention is to stick with bi-metal blades. These combine hard-steel teeth with a softer steel shank that's more flexible.

Blades generally come with 6, 8, 10, 12, or 20 teeth per inch (tpi). The fewer teeth, the more aggressive the cut (but you also get more tearout). An 8-tpi blade works fine for most general purpose cutting, although if your material splinters easily, you may want to use 10-tpi blades.

Blade teeth can be ground flat with no set, with side set, or with wavy set, as shown at *left*. Flat-ground blades leave little tearout and cut smoothly, but they go slow and won't cut tight arcs. Side-set blades, with teeth angled out on alternating sides, cut curves and straights equally well, but leave the most tearout and a wide kerf. Wavy-set blades are ground flat and then gently bent in a curved pattern. They corner better than flat-ground blades and leave less tearout than side-set blades, but they run slowest of all. Use wavy-set blades for tight, smooth scrollwork, and for cutting metal, ceramics, plastics, and other non-wood materials.

The width of your blade also affects its ability to cut curves. Skinnier blades turn tighter but they bend easier. For tight scrollwork, buy blades that are from 1/32" to 3/16" wide. For cutting curves with a large radius, or for general-purpose cutting, blades that are 1/4" or wider work best.

if you can plug it in...we've got it!
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LU82M010 10" 60T Chipboard 45
LU89M010 10" 72T Aluminium 56
LU92M010 10" 60T Corian® 58
LU98M010 10" 80T Laminates 66
LU72M010 10" 40T ATB 39
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5362-1 1" Hawk Hammer 318
5365-1 1" Hawk Hammer Kit 348
5369-1 3/4" D-handle Falcon Kit 248
5371-1 1/2" Hammer Drill 183
5375-1 1/2" Hammer Drill Kit 178
5392-1 3/8" Hammer Drill 126
6140 4 1/2" Grinder 98
6142 4 1/2" Grinder Kit 123
6175 14" Chop Saw 278
6369 7 1/4" Circ.saw Kit 147
6460 10" Circular Saw 258
6490 10" Miter Saw 254
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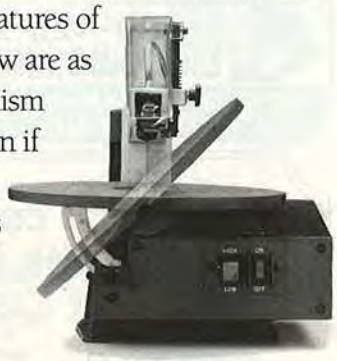
You don't get named a *Consumers Digest* Best Buy without working at it. You have to be an *outstanding* value. That's the Dremel 1671 Scroll Saw.

The Dremel 1671 has a lot of features that make it a pleasure to use. It has two cutting speeds and a powerful motor that lets you buzz through wood up to two inches thick, as well as sheet metals and plastics.

The sturdy, 12-inch cast aluminum table is adjustable from 0° to 45° for accurate bevel cuts up to 1-inch thick.

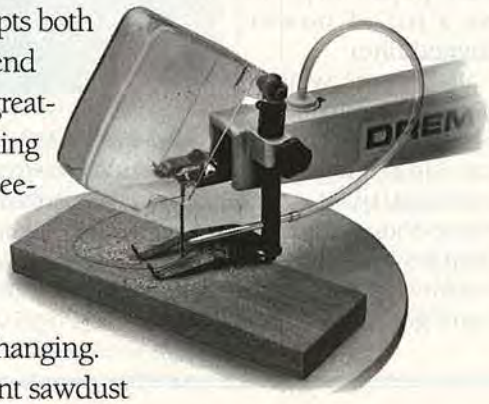
Of course, not all the features of the Dremel 1671 Scroll Saw are as obvious. A special mechanism quickly stops cutting action if the blade breaks. And the heavy cast-iron base keeps vibration to a minimum.



So if you're searching for the perfect scroll saw for your craft or other woodworking projects, check out the Dremel 1671.

A 16-inch throat and the ability to cut from both the front and the side, means you can handle large work pieces.

The saw accepts both plain- and pin-end blades, for the greatest possible cutting versatility. The see-through blade guard pivots out of the way for easy blade changing. And a convenient sawdust blower keeps your cutting line clear for accurate cuts.



And see why *Consumers Digest* placed it a cut above the rest.

For a free copy of the *Dremel Scroll Saw Blade Application Guide* write to: Dremel, Dept. S-W, P.O. Box 1468, Racine, WI 53406-1468.

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Top-toting shop vacuum won't scream in your ears

I'll never forget how much simpler clean-up chores became after I bought my first shop vacuum. But I've yet to grow fond of the high-pitched howl these machines produce. This new 12-gallon Shop-Vac QSP cuts the noise level considerably and offers several convenient features.

A top shroud muffles the sound on this new machine and channels the exhaust through two ports in the rear. This baffled air still makes noise, but you hear a low roar rather than the ear-splitting scream most machines make. With this new vacuum running, you can still hold a conversation or listen to a radio.

The machine's three-stage filtering system starts with a disposable paper bag that traps about 99 percent of the debris, much like the bag in home vacuum cleaners. The next two stages of the filtering system—a tightly woven fabric filter and a foam "sock"—cover the motor inlet cage. After you've collected enough dust and debris to fill the large paper bag, just remove it from the canister and throw it away. The bags cost about $3 each and come in packages of three. To clean the foam and fabric filters, simply wash them and let them dry.

Unlike pleated vacuum filters, the foam and fabric filters stay clean due to the paper bag. So you don't lose a lot of power because of a clogged filter.

This machine also scores well in the user-friendliness department. Rather than having to roll it around, you can single-handedly pick up the vacuum by its top handle. The Shop-Vac QSP also includes side handles and casters, but I found it easier to just grab the top handle and go.

The inlet-port diameter measures 2½", so you can hook up additional accessories that you own in that size, but this model comes with a 1¼" hose and accessories. The 2-hp motor put out enough suction to draw sawdust, shavings and some small nails off my shop floor. And when hooked to my dust-collection system, it easily whisked away the sawdust coming off my power tools. In addition to the model I tested, you also can find the QSP in 6-, 8-, 10-, and 16-gallon sizes.

All these small improvements add up to a lot of convenience, and I found the Shop Vac QSP a pleasure to use.

—Tested by Bob McFarlin

Shop-Vac 12-Gallon QSP, about $99 at discount, homecenter, lumber, and hardware stores nationwide. Or write to Shop-Vac at: 2323 Reach Rd, P.O. Box 3307, Williamsport, PA 17701-0307. Call 717/326-0502.

Quick-release clamps also sit flat and sturdy

This new C-clamp from Wolfcraft offers a quick-release mechanism and a uniquely flat profile. Most woodworkers appreciate a quick-release button, but the more I used these cast-aluminum clamps the more I found to like about their three flat sides.

The flat sides provide a stable platform, enabling me to join small, light assemblies with just one clamp and stand them up to dry. The clamp won't roll over and knock the workpiece out of kilter. And, you can use two of these clamps as legs to prop up jigs and fixtures.

The narrow profile of the handle also created some new possibilities. I could lay the clamp on its side and hold a workpiece to my tablesaw miter gauge and not worry about a lever-type handle getting caught on the edge of the table. The triangular cross section of the handle (rather than round) enables you to get a good grip for more torque.

Considering the price, you probably won't want to restock your entire C-clamp collection with these. But I found them so useful that I'd recommend a pair or two for anybody's shop.

—Tested by Chuck Hedlund

Wolfcraft Quick-Jaw C-Clamp, in 3", 4", and 6" sizes, about $13, $15, and $18 respectively, at discount, hardware, and homecenter stores nationwide. Or write to: Wolfcraft, Inc., 1222 West Ardmore, Itasca, IL 60143. Call 708/773-4777.

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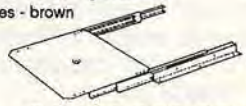

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SHOP TESTED

Continued from page 75

Steady your work with a grinder tool rest

Most bench grinders come with nearly useless tool rests. The new Veritas Grinder Tool Rest provides a sorely needed solution.

When bolted to my benchtop, this anodized-aluminum tool rest gave my chisels and plane irons steady support. The handles tighten and untighten easily, and you can adjust the tool rest to many different angles or heights thanks to the slotted support arms. The top of the tool rest has a groove for sliding jigs and a hole for rotating jigs.

The tool rest works with 6" and 8" grinders, and a notch in the front straddles wheels up to 1" wide. If you've had trouble keeping tools steady on a standard grinder tool rest, I think you'll enjoy the control and precision you get with this new tool rest.

—Tested by Chuck Hedlund

Veritas Grinder Tool Rest, $40.45 ppd., from Veritas Tools, Inc., PO. Box 1720, Ogdensburg, NY 13669-1720. Call 800/667-2986.

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DW945K2	12V CORDLESS KIT W/2 BATTERIES	166

HITACHI

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WHAT YOU SHOULD KNOW BEFORE YOU HAUL

Getting stock to your shop

Okay, you're ready to start a project, but worried over how you're going to bring stock home. You don't own a pickup or a van. And, what you plan to buy falls far short of the minimum purchase required for free delivery (normally $500). What to do?

Never fear, there are ways to haul material yourself, even in the family sedan. But keep the following in mind:

- Always check your vehicle's owner's manual for its maximum load capacity and the suggested tire pressure.
- Spokesmen at two large Midwest home center chains, Menards and Payless Cashways, told us that their liability insurance companies forbid employees to secure purchases to your car, although employees *can* help load.
- Ask for a free red flag if any part of the load extends 3' or more beyond the rear of your car (it's usually required by law.)

Team up with store-bought solutions

If your car has a roof rack, take advantage of it as the basis for all your tie-downs. Or, for about $30 at auto supply stores, you can purchase a removeble top carrier.

There's also a helpful product available through home centers, hardware stores, or mail order, called Timber Tote, shown *right*. Along with the tubular steel "hooks," you get instructions, poly rope for tying, and protective padding. You can order Timber Tote from Jupiter Products, P.O. Box 4367, Centerline, MI 48015, $28.47 ppd. ($29.47 in Mich.), or call 800/833-9050.

Try the homespun approach for short trips

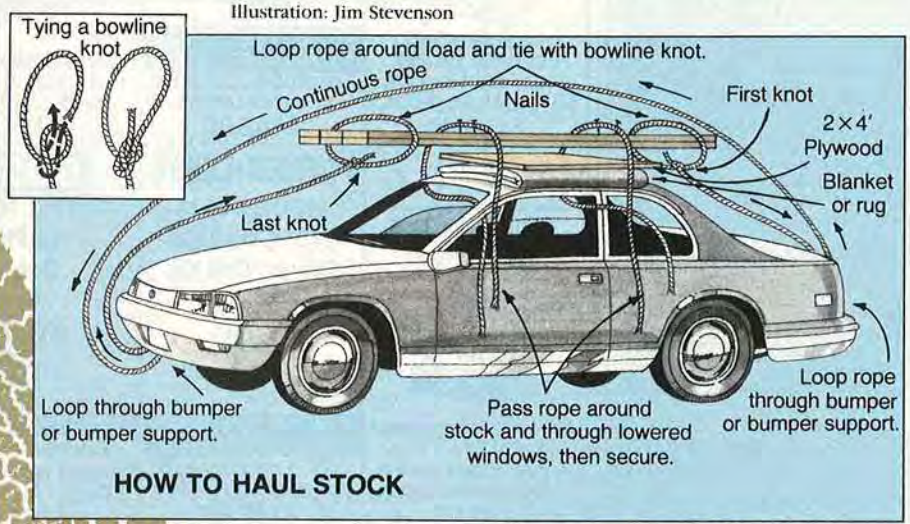
If you don't have to haul a great distance, you can safely secure a load with materials you have on hand. First, find an old blanket or rug to put on top to prevent marring your car's finish. Then, gather a hammer, a few small common nails, a pocketknife, and a 30' length of nylon or poly rope. (The twine a lumberyard or home center provides isn't strong.) And, if you'll only be buying boards, you'll want a 2x4' piece of plywood to spread the load.

When you load your purchase, first place the padding you brought along on top of the car's roof. On it, lay the 2×4' sheet good for carrying boards, or place any sheet goods you may have purchased on the padding. Next, add the boards, stacking them evenly two or three wide. Finally, secure the load with three pieces of rope as shown *below*.

To keep the fastened boards from shifting forward or backward, drive two nails into the top board where each of the rope loops circle the material. (You can pull the nails later.)

If thin sheet goods (less than ⅝" thick) are your only purchase, bring along 2×2s or 2×4s to place lengthwise between the panels to stiffen them against wind lift, and then fasten the load as described above.

Illustration: Jim Stevenson


Tying a bowline knot
Loop rope around load and tie with bowline knot.
Continuous rope
Nails
First knot
2×4' Plywood
Blanket or rug
Last knot
Loop through bumper or bumper support.
Pass rope around stock and through lowered windows, then secure.
Loop rope through bumper or bumper support.

HOW TO HAUL STOCK

Accessories such as a top carrier or a rack like Timber Tote, *below*, allow you to transport stock easily as well as safely.

Print this article

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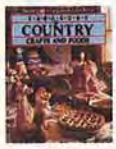

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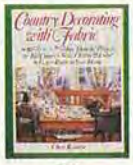

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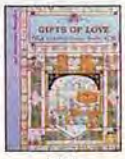

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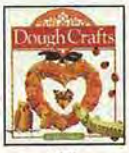

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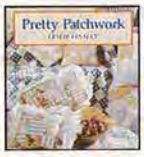

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Model	Description	List	Sale
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23-680	6" Bench Grinder 1/4 HP	86	75
23-880	8" Bench Grinder 1/2 HP	151	115
11-950	8" Drill Press	199	144
31-050	1" Belt sander 2.0 amp	104	78
31-460	4" Belt/Disc Sander	198	129
31-340	1" Belt/8" Disc Sander	268	204
31-080	1" Belt/5" Disc Sander	134	94
40-560	16" 2 speed Scroll Saw	266	178
11-990	12" Bench Drill Press	276	205
11-090	32" Radial Bench Drill Press	399	305
43-355	3/4" Shaper 1-1/2 HP	964	749
43-505	1/2" Bench Router/Shaper	399	279
22-540	**12" Bench Top Planer**	398	
36-220	10" Compound Mitre Saw	350	229
28-180	Bench Band Saw	232	165
28-190	NEW 12" Band Saw	465	365
40-640	20" Bench Scroll Saw	466	295
37-070	NEW 6" w/spd Bench Jointer	337	254
14-650	Hollow Chisel Mortiser	668	289
46-700	12" Wood Lathe	548	445
33-990	10" Radial Arm Saw	818	639
37-280	6" Motorized Jointer	488	395
37-154	DJ15 6"Jointer w/3/4HPmotor	1451	1155
50-179	3/4 HP 2 stage Dust Collector	483	345
33-055	8-1/4" Sawbuck comp w/legs	865	615
34-330	8-1/4" Table Saw 13 amp	343	245
32-100	Stationary Plate Jointer	645	249
36-040	8-1/4" Compound Mitre Saw	224	155
34-915	30" Unifence	385	239
34-897	50" Delta Unifence	525	285
36-755	10" Tilt Arbor Saw	1264	965
34-444	Contractors Table Saw	812	619
34-445	34-444 Saw w/30" Unifence	1200	775
17-900	16-1/2" Floor Drill Press	462	399
40-601	18" Scroll Saw with stand	1003	749
22-661	13" Planer with 2HP motor	1513	1189
33-060	"Sidekick" Miter Saw	510	369
14-070	14" Floor Drill Press	450	349
50-075	Dust Collector/Sweeper 3/4 HP	360	249
28-283	14" Band Saw w/enc. stand	910	745
37-190	NEW 6" Deluxe Jointer	554	469
36-275	NEW 8-1/4" Builders Saw	444	265
36-210	NEW 10" Compound Mitre Saw	438	259
36-070	NEW 10" Mitre Saw	284	169

MILWAUKEE TOOLS

6527	NEW Sawzall with case	320	168
6528	above Sawzall w/wired cord	316	168
6125	NEW 5"Random Orbit Sander	200	114
6126	NEW 6"Random Orbit Sander	205	119
0399-1	12V cordless Drill Kit comp	315	172
0402-1	**above Drill w/kyls chuck & 2 batt**		174
0395-1	9.6V cordless Drill with case	290	158
0224-1	3/8" Drill 4.5 amp magnum	227	119
0234-1	1/2" Drill 4.5A mag 0-850 rpm	237	124
0244-1	1/2" Drill 4.5A mag 0-600 rpm	237	124
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	198	107
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	195	109
0375-1	3/8" close quarter Drill	237	127
0379-1	1/2" close quarter Drill	268	148
6546-1	cdls Scrwdvr 200 & 400 rpm	141	82
5399	1/2" D-hdle Hammer Drill Kit	332	194
6750-1	Drywall Gun 0-4000 5 amp	171	94
6507	Orginal SawZall with case	264	144
6010	Orbital Sander 1/2 sheet	214	118
8977	Variable temp. Heat Gun	131	77
5397-1	3.8" var. spd Hammer Drill Kit	255	142
5371-1	1/2" var. spd Hammer Drill Kit	340	184
3107-1	1/2" v/spd right angle Drill Kit	399	219
6754-1	Drywall Gun 0-4000 5.4 amp	196	112
3300-1	1/2" var. spd right angle Drill	356	192
5680	Router 2 HP - 12 amp	362	198
0235-1	1/2" Drill w/keyless chuck	237	128
6142	4-1/2" Grinder w/case & access.	208	124
6749-1	Drywall Gun 0-2500 5.4 amp	218	124
6365	7-1/4" Circular Saw 13 amp	218	122
6366	6365 w/fence & carbide blade	228	127
6368	6365 w/fnce,carb. blde,& cse	249	139
6377	7-1/4" Worm Drive Saw	330	184
6256	Top Handle Jig Saw	264	148
6490	10" Mitre Saw	444	255

FREUD CARBIDE TIPPED SAW BLADES
5/8" Bore - Industrial Grade

Item	Description	Teeth	List	Sale
LU72M010	Gen Pur. A.T.B.	10"	49	39
LU82M010	Cut-off	10"	93	49
LU84M011	Comb	10"	50	78
LU85M010	Super Cut-off	10"	80	115
LM72M010	Ripping	10"	24	69
LU73M010	Cut off	10"	60	84
LU87M010	Thin Kerf	10"	24	72
LU88M010	Thin Kerf	10"	60	88
LU98M010	Ultimate	10"	80	128
LU91M010	Compnd Mitre	10"	60	88
F410	NEW Quiet Blade	10"	40	95
F810	NEW Quiet Blade	10"	80	135
TK303	7-1/4" Finishing		40	38
TK906	10" Combo		50	53
SD306	6" Dado - Carbide			215
SD308	8" Dado - Carbide			230
SD506	6" carbide w/case & shims			292
SD508	8" carbide w/case & shims			344
F0	1-3/4" x 5/8" Biscuit 1000 Qty		43	29
F10	2-1/8" x 3/4" Biscuit 1000 Qty		43	29
F20	2-3/4" x 1" Biscuit 1000 Qty		45	29
FA	Assorted Biscuits 1000 Qty		45	29
FB100	16 piece Forstner Bit Set		338	184
94-100	5 pc. Router Bit Door System		320	159
TR215	NEW 10" Slide Cmpd Mitre Saw		688	359
FT2000E	3-1/4 HP v/sp Plunge Router		410	205
JS100	Biscuit Jointer with case		334	164
JS102	NEW Biscuit Jointer w/adj fnc&cs		355	188

MAKITA TOOLS

Model	Description	List	Sale
6070DW	3/8" v/spd Reverse Drill 7.2V	128	74
6071DWK	above Drill w/removable batt.	216	119
5090DW	3-3/8" Saw Kit 9.6 volt	270	139
6010SDW	3/8" cordless Drill Kit 7.2V	99	59
ML900	Incandescent Flashlight 9.6V	Sale	37

6012HDWE	2 speed Drill Kit w/2 batt.	243	129
6093DWE	6093DW Drill Kit w/2 batteries	270	139
6095DWE	**6095DW Drill Kit w/2 batteries**		139
6201DWE	NEW 9.6V Drill Kit w/2 batt.	298	158
6211DWE	12V Drill Kit with 2 batteries	330	168
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28

5007NBA	7-1/4" Saw w/electric brake	263	129
5008NBA	8-1/4" Saw w/electric brake	346	195
B04510	1/4 sheet Pad Sander	106	59
9900B	3" x 21" Belt Sander w/bag	344	159
9924DB	3" x 24" Belt Sander w/bag	329	169
4301BV	Orb. var. spd Jig Saw 3.5A	292	169
JR3000V	var. speed Recip Saw w/case	252	135
LS1020	10" Mitre Saw 3.5 amp	630	355
9820-2	Blade Sharpener	394	199
N1900B	3-1/4" Planer with case	244	129
1911B	4-3/8" Planer 7.5 amp	309	179
9514B	4" Disc Grinder 4.6 amp	111	59
3601B	1-3/8 HP Router	288	165
B04550	1/4 sheet Pad Sander w/bag	98	54
DA3000R	3/8" Angle Drill	314	155
2708W	8-1/4" Table Saw	585	298
2711	10" Table Saw with brake	1067	565
6404	3/8" Drill Rev. 0-2100 rpm	112	58
6510LVR	3/8" Drill Rev. 0-1050 rpm	168	93
6820V	0-4000 rpm Drywall Gun	171	92
6013BR	1/2" Drill Rev. 6 amp	280	139
5402A	16" Circular Saw 12 amp	743	429
9401	4" x 24" Belt Sander w/bag	378	205
4302C	var. speed Orbital Jig Saw	351	199
5077B	7-1/4" Hypoid Saw	281	155
LS1030	NEW 10" Mitre Saw	428	225
5007NB	7-1/4" Circular Saw 13 amp	232	124
2012	12" Portable Planer	959	539
LS1011	10" Slide Compound Saw	946	539
AN8300	NEW Pneumatic Fram. Nailer	850	445

SIOUX TOOLS

8030	New 3/8" var/spd Drill	250	145
8000	3/8" var/spd close qtr Drill	201	125
690	5" Air Random Orbit Sander	139	132

SENCO AIR NAILERS

SFN1	Finishing Nailer 1" - 2"	448	298
SFN2	Finish. Nailer 1-1/2" - 2-1/2"	571	375
SN325	Nailer 1-7/8" - 3-1/4"	665	419
SLP20	New Pinner w/cse 5/8 -1-5/8"	399	269
SKS	Stapler 5/8" - 1-1/2"	390	259
SN70	Fram. Nailer Clip Hd 2"-3-1/2"	690	475
SN60	Fram. Nailer-Full Hd 2"-3-1/2"	638	455
SFN40	NEW Finish Nailer 1-1/4 - 2-1/2	571	385

BOSTITCH AIR NAILERS

N80S-1	Stick Nailer	Super Sale	348
RN45	Coil Roof Nailer 3/4 - 1-3/4	845	425
N60FN-2	Finishing Nailer	650	335
T31	Brad Nailer	281	145
CWC100	1 HP Pancake Compressor	463	289

EXCALIBUR Fences & Tables

TT45R24L9	24" Fence	369	299
TT45R50L12	50" Fence	399	318
EXSLT30	Sliding Table	599	475
EXSLT60	Sliding Table	745	585

SKIL SIZZLERS

77	7-1/4" Worm Drive Saw	257	144
2735-04	12 volt cordless Drill Kit	249	144
2736-04	2735-04 with keyless chuck	269	145
1605-02	Biscuit Joiner w/case	221	129
3400	10" Table Saw - Bench Top	270	185

PANASONIC CORDLESS

EY6205BC	Variable speed 12 volt Drill	353	185
EY6205EQK	Same as EY6205BC but comes with **Ironman** battery	368	192
EY6207BC	NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 min. charger & case	420	222
EY6282EQK	Var. spd 9.6 volt Drill with 15 min. charger, case & NEW **Ironman** battery	315	229
EY62821DKW	9.6 volt Drill Kit w/2 batt.	395	162
	NEW PREDATOR DRILLS		
EY6181CRKW	NEW 9.6V Compact Drill Kit w/2 batt - 10% more pwr than EY62821DKW	305	158
EY6100CRKW	NEW 12 volt Drill Kit with 2 batteries, 1 hour charger, & case	358	189
EY6100EQK	NEW 12 volt Drill kit with NEW **Ironman** battery, 15 min. charger, & case	375	199

PASLODE IMPULSE GUNS

IM250	Trimpulse Finish Nailer Kit	849	565
IM325	Impulse Framing Nailer Kit	849	565

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120	Power Sprayer	70	57
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255	Airless Kit	180	130
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550	Pro Airless Painting System	769	685
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CS2000	Pro fine finish HVLP System	339	269

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Brad Nailer 3/4"-2"
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1/4" Crown Stapler 3/8"-1"
List 194 Sale 109

0635SK
1/4" Crown Stapler 1/2"-1-3/8"
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DEWALT TOOLS

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DW944K-2	3/8"9.6V cdls Drill Kit w/2 batt	283	149
DW6101	1-1/2 HP 2 handle Router	274	154
DW411	1/4 sheet Palm Sander, 1.7 amp.	97	58
DW100	3/8" Drill, 4 amp,0-2500 rpm,rev,	118	68
DW682K	NEW Biscuit Joiner with case	429	238
DW705	12" Compound Mitre Saw	706	385
DW615	NEW 1-1/4 HP Elec. Plge Router	290	158
DW625	**NEW 3 HP var. spd Plunge Router**		274
DW675K	NEW 3-1/8" Planer with case	289	164
DW431	NEW 3 x 21 v/spd Belt Sander	331	189
	NEW DEWALT CORDLESS DRILLS		
DW952K	3/8" v/spd incl. one 9.6V batt	280	165
DW953K	3/8" v/spd incl. one 12V batt	306	179
DW962K-2	3/8"v/sp incl. two 9.6V XRbatt	324	189
DW972K-2	3/8"v/sp incl. two 12V XRbatt	352	199
DW991K	3/8"v/sp incl. one 14.4V XRbatt	370	219

Above drill kits come w/charger & steel case!

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401	Porta Nailer complete	265	205
501	Face Nailer complete	265	205

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6204	4' Fiberglass	179	65
6205	5' Fiberglass	199	75
6206	6' Fiberglass	225	82

HITACHI TOOLS

F1000A	12" Planer/6" Jointer	2970	1559
P12R	12-9/32" Planer	1470	779
P12RA	Planer/Jointer	1940	989
C8FB	8-1/2" Slide Compound Saw	1400	599
G12SA	4-1/2" Grinder 6.9 amp	160	89
DS10DVAK	NEW 12V Cordless Drill Kit	393	199
NR83A	Fram Nailer 2 - 3-1/2 Full Head.	700	385
NR83AA	Framing Nailer 2 - 3-1/2 Clip Head	750	409
NT65A	16 ga. Brad Nailer 1 - 2-1/2	610	318
NV45AB	Coil Roofing Nailer 7/8 - 1-3/4	750	395
NV83A	Coil Nailer 2 - 3-1/4	750	415

BIESEMEYER FENCES

B-50	50" Commer. Saw Fence	345	298
T-SQUARE 52	52" Homeshop Fence	279	238
T-SQUARE 40	40" Homeshop Fence	259	208
T-SQUARE 28	28" Homeshop Fence	249	198

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Open Cap	List	Sale	Box of 6
#0	8"	4-1/2"	19.76	11.75	58.00
#1	10"	6"	22.63	12.50	68.00
#2	12"	8-1/2"	25.95	14.50	78.00
#3	14"	10"	32.88	18.00	99.00
#4	16"	12"	42.76	23.95	139.00

JORGENSEN STYLE 37 2-1/2"Throat 1/4"x3/4"

Item#	Jaw Length	List	Sale	Box of 6
3706	6"	10.67	6.05	32.50
3712	12"	11.82	6.50	35.10
3718	18"	13.04	6.99	37.75
3724	24"	14.25	7.99	42.50
3730	30"	15.88	8.85	47.75
3736	36"	17.36	9.99	53.95

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	3/4" Black Pipe Clamps	14.87	7.90	89.95
52	1/2" Black Pipe Clamps	12.40	6.80	72.95

BOSCH

Model	Description	List	Sale
1587VS	NEW Top Hand "CLIC"Jig Saw	292	149
1584VS	NEW Barrell"CLIC"Jig Saw	285	149
Bosch Metal Case for above Jig Saws		34	32
Bosch 30 blade assortment for Jig Saws		27.99	
1942	Heat Gun 600° - 900°	125	78
1272D	3" x 24" Belt Sander with bag.	375	204
1273D	4" x 24" Belt Sander with bag.	380	208
11-212VSR	Bulldog 3/4"SDS Rtry Drill	390	209
1347AK	4-1/2" Grinder w/cs & access.	185	109
1348AE	5" Grinder 8.5 amp	225	129
1194VSR	1/2" var. speed Hammer Drill	282	155
1194VSRK	above Hammer Drill w/case.	313	169
1608	5.6 amp Laminate Trimmer	168	95
1609K	Lam Installers Kit with 1609	343	184
1609KX	Deluxe Installers kit	405	228
1604A	1-3/4 HP 2 Handle Router	250	139
1604AK	same as above w/cse & acc.	318	185
1606A	1-3/4 HP D-handle Router	295	185
3258	3-1/4" Planer w/blade guard	247	155
3258K	3258 Planer with steel case	273	169
3270DVS	3 x 21v/spd belt sander w/ bag	270	165
1273DVS	var. spd 4" x 24" Belt Sander	415	209
1614	NEW 1HP Plunge Router	245	149
1614EVS	NEW 1-1/4HP v/spd Plge Rtr.	283	155
1613	NEW 1-3/4 HP Plunge Router	316	164
1613EVS	**NEW 2HP v/sp Plunge Router**		183
1615	NEW 3 HP, Plunge Router	430	228
1615EVS	NEW 3 HP v/spd Plge Router	505	255
1632VSRK	Recip Saw 8.4A orb-v/spd	225	154
3050VSRK	9.6V cdls v/sp Drill Kit comp	288	138
3051VSRK	3050VSRK w/keyless chuck	299	145
1370DEVS	6" Random Orbit Sander	427	219
3283DVS	5" Random Orbit Sander	169	98
3283DVSK	3283DVS Kit complete	199	118
B1650K	NEW Biscuit Joiner	289	165
B7000	NEW Corner Detail Sander	122	79
B4050	NEW In Line Jig Saw	199	119

ELU BY BLACK & DECKER

Model	Description	List	Sale
3338	2-1/4 HP v/spd Plunge Router	501	199
3375	3-1/8" Univ. planer 7.2 amp	329	159
3380	Biscuit jointer with case	569	185
3339	NEW 3 HP v/sp Plunge Router	511	269

BLACK & DECKER

1166	3/8" Drill 0-2500 rpm 4 amp	118	65
79-034	Workmate 400	181	109
2694	7-1/4" Super Sawcat w/case	285	152
2695	8-1/4" Super Sawscat w/case	328	162

DAVID WHITE

LP6-20	Sight Level package - 20x	310	195
LP6-20XL	LP6-20 w/9056 tripod & 7620 rod		259
L6-20	Meridian Level - 20x	290	188
LT8-300	Level Transit - 26x	695	445
LT8-300P	above Level w/optical plum	821	518
LT6-900	Level Transit - 20x	389	249
ALT6-900	Automatic Level - Transit -18x	638	409
ALTP6-900	above Level w/tripod & rod	708	469
ALP6-18HD	above Level w/tripod & rod	570	375
ML100I	NEW Laser Level	1099	945
ML100	NEW Laser Level w/detector.	1249	1075

RYOBI SPECIALS

TS-254	10" Mitre Saw	440	209
RE600	3 HP Plunge Router	500	235
BE321	3" x 21" var. spd Belt Sander	310	135
TFD222VRK	12V cordless Drill Kit	365	155
TFF100	Flashlight uses 7.2,9.6,12v battery		29.95
JM100K	Biscuit Jointer w/case	475	219
BT3000	10" Table Saw with stand	1125	529
TSS220	8-1/2" Slide Comp. Saw	966	445
DS1000	NEW Detail Sander	90	44
AP12	NEW 12" Bench Planer	884	399
RA202	NEW 8-1/4" Bench Radial Saw	800	389
BS900	NEW 9" Bench Band Saw	340	174
OSS450	NEW Oscilating Spindle Sander	340	174

LAMELLO BISCUIT JOINTERS

TOP 10	"Simply the Best"	699	538
STANDARD 10	"Professionals Choice"	499	399

Msx636 FEIN	Triangle Sander Kit	Sale	185
LPN672 PONY	Air Palm Nailer w/glove	Sale	94.99

QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
	Buy any 6 (can be assort.) deduct 10%		
2601	Wall Jack	167	108
	Lots of 4 deduct additional 10%		

PORTER CABLE

690	1-1/2 HP Router 8 amp	260	138
691	1-1/2 HP Router D-handle	285	155
695	1-1/2 HP Router/Shaper	400	223
696	HD Shaper Table	230	129
351	3" x 21" Belt Sander w/o bag	280	154
352	3" x 21" Belt Sander with bag.	290	159
360	3" x 24" Belt Sander with bag.	365	194
361	3" x 24" Belt Sander w/o bag	345	194
362	4" x 24" Belt Sander with bag.	380	205
363	4" x 24" Belt Sander w/o bag	360	195
315-1	7-1/4" Top Hdle Circular Saw	225	118
9315-1	315-1 comp. w/cs & carb bld.	255	139
97751	1/2" v/spd Hammer Drill w/cse	270	155
9118	Porta Plane Kit 7 amp	390	215
505	1/2 sheet Pad Sander	230	128
6611	3/8" var. speed Drill 5.2 amp	220	125
6614	1/2" var. speed Drill 0-750 rpm	230	128
6615	7514 with keyless chuck	230	128
7549	Top handle Jig Saw 4.8 amp	270	135
330	Speed Block Sander 1/4 sheet	110	60
555	Plate Biscuit Jointer with case.	320	165
556	**555 jointer w/5556 tilt fence**		184
345	6" Saw Boss 9 amp	190	104
9345	345 comp. w/cse & carb blde.	220	124
9647	TIGER CUB Recip. Saw	210	119
9637	Full var/spd Recip Saw 8 amp	270	148
7519	3-1/4 HP Router 2 Handle	445	239
7518	3-1/4 HP 5 speed Router	510	275
7538	3-1/4 HP Plunge Router	445	239
7399	5.6 amp Drywall Cutout Unit	140	84
7310	5.6 amp Laminate Trimmer	165	95
97310	Laminate Trimmer Kit comp	360	198
7334	5" Random Orbit Sander	225	122
7335	5" var. spd Rndm Orbit Sndr	245	132
7336	6" var. spd Rndm Orbit Sndr	250	137
73333	Dust Collection system	31	24.50
693	1-1/2 HP Plunge Router Base	320	174
6931	Plunge Router Base	125	77
7539	3-1/4HP v/spd Plunge Router	510	275
9852	12V 3/8"Drill w/cse 0-1000rpm	280	154
9853	9852 with keyless chuck	280	154
9855	12V 1/2" 2 spd,v/sp Drill w/cs	335	188
8500	12V battery for above drills	Sale	45
	New Tools by Porter Cable		
9841	9.6V Drill Kit-15 min. charger	309	172
9840	9.6V Drill Kit with 2 batteries	289	164
332	Palm Grip Rndm Orbit Sander	120	69
333	above Sander with dust bag	135	75
334	333 Sander with PSA pad	135	74
352VS	3x21 Belt Sander w/bag v/spd	305	169
7116	24" Omni Jig	535	294
550	Pocket cutter with case	330	179
310	Production Laminate Trimmer	250	145
7700	10" "Lazerloc" Mitre Saw	634	344
347	7-1/4" "Framers" Circ Saw	225	129
447	347 Saw with brake	245	139

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FINISHING TOUCHES

FAMED STICKMAKER TAKES THE LONGEST WALK

Stickmaker Theo Fossel holds one of his duck-head handled walking sticks.

Theo Fossel, the well-known English stickmaker who founded the Brtitsh Stickmakers' Guild and was instrumental in establishing a similar North American organization, lost a long bout with cancer last September. He passed on quietly at his country home in Buckinghamshire, England. Theo and his carved walking sticks were featured in the February 1990 issue of *WOOD*® magazine.

The witty 56-year-old master craftsman almost singlehandedly revived the stickmaking art in Great Britain, then got it going in the U.S. Theo's fetching manner and humorous anecdotes also endeared him to novice stickmakers at seminars from Alaska to Louisiana and into Canada.

As Theo liked to proclaim, "A stick makes a jolly good companion." Those who knew him would agree that he made a wonderful companion, too.

Photographer's turning to White House collection

You may not have known it, but 1993 was "The Year of American Craft" as mandated by the President and the U.S. Congress. For semi-retired photographer Bob Hawks, of Tulsa, Oklahoma, however, it was a year to remember.

The *WOOD* magazine staff has known Bob for years in his role as a top-notch magazine photographer. However, few knew of his growing expertise in woodturning, a skill Bob started honing only about six years ago. Others had noticed his work, though, especially Michael Monroe, director of the Smithsonian's Renwick Gallery in Washington, D.C.

As a result, last fall Bob was asked to contribute one of his turned bowls to the permanent White House collection being assembled by the President and Mrs. Clinton. Joining him in contributing were 14 of the nation's top turners—names whose works he had long admired. So what was Bob's reaction?

"I still can't believe it," says Bob. "For the last few years, I've been spending only half my time turning, then one of my pieces ends up in the White House!"

▲Woodturner Bob Hawks and his wife Jan celebrate craft at the White House with President and Mrs. Clinton.

◄Bob's purpleheart, yellow wood, and ebony turning is now part of the White House's craft collection.

New Zealand Pine Toughens Up

Researchers at the New Zealand Forest Research Institute have developed a process that makes their greatest lumber export, plantation-grown radiata pine *(Pinnus radiata)*, as tough as oak. As a result, woodworkers and carpenters are now substituting the softwood for hardwoods in flooring, furniture, cabinets, and even benchtops, says the forest products' magazine *New Zealand Pine International.*

The process, which took six years to develop, involves impregnating pine logs with a non-toxic plant substance. Curing the logs with heat forms a strengthening polymer in the wood. Researchers also found that adding color assists the transformation to "hardwood."

HOW MUCH WOOD DOES A WOODWORKER USE, ANYWAY?

Do you ever catch some flack for your woodworking, such as, "You're ruining the environment by using wood!"? Well, here are a few facts writer David Averill dug up for an editorial in *The Tulsa World*. David was defending the use of wooden signs by a local civic organization called "Up With Trees." The non-profit group has been greening up the city with tree plantings for years, and commorating the trees' donors with the 5'8"×10' signboards.

David talked with a forestry professor at the University of Oklahoma and found out that one cubic foot of timber produces about 5.5 board feet of sawed lumber. And Oklahoma grows around 196 million cubic feet of timber annually. That's more than a billion board feet of lumber. Up With Trees' signs—constructed as a community project by the Green County Woodworkers—each require 58 board feet. According to the writer's calculations, that means that Oklahoma grows enough timber in one second to construct nearly 600,000 Up With Trees signs! So, how's that for a renewable resource?

Photographs: Mike Pattison; Jim Caruthers Illustrations: Jim Stevenson

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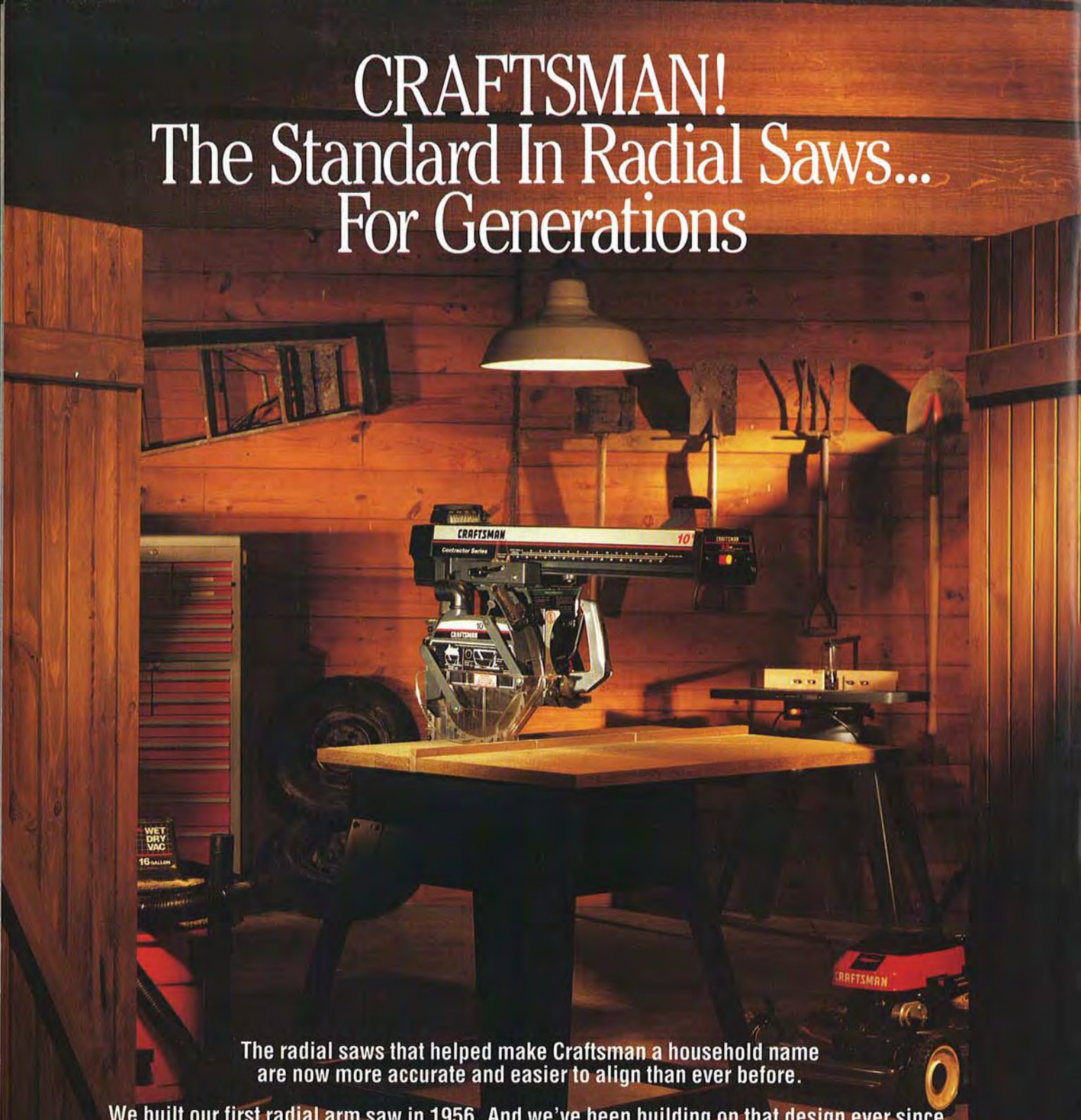

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